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Section

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

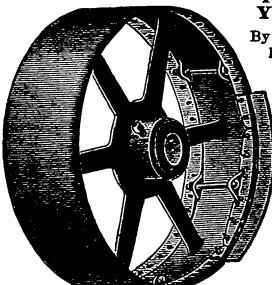
Published every Thursday Morning by David Williams, Nos. 96, 98, 100 & 102 Reade St., New York.

Vol. LIII: No. 3. New York, Thursday, January 18, 1894.

\$4.50 a Year, including Postage.
Single Copies, Ten Cents.

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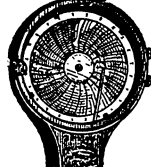
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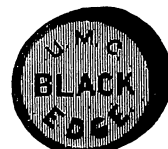
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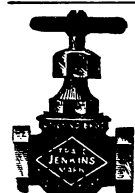
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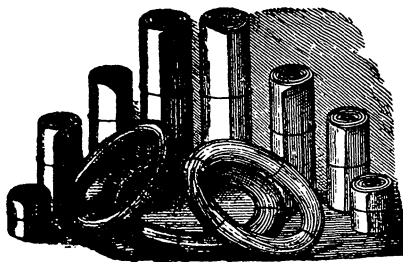
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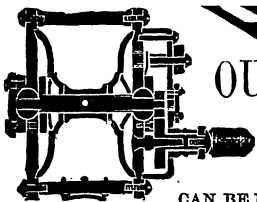
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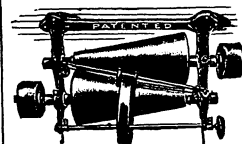
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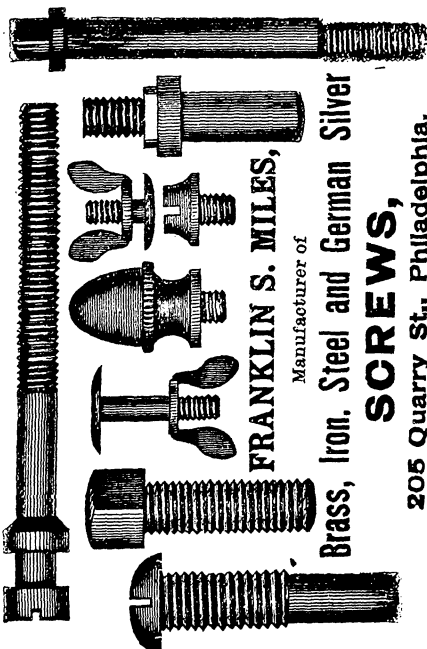
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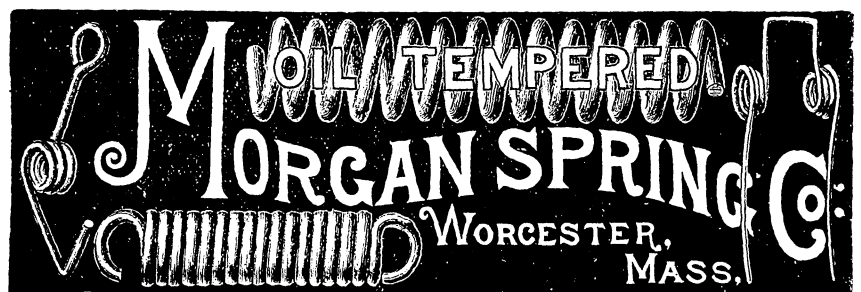
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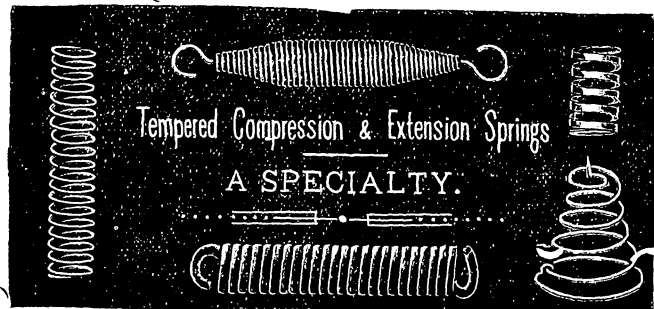
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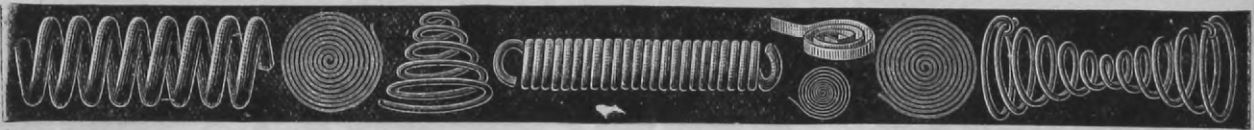
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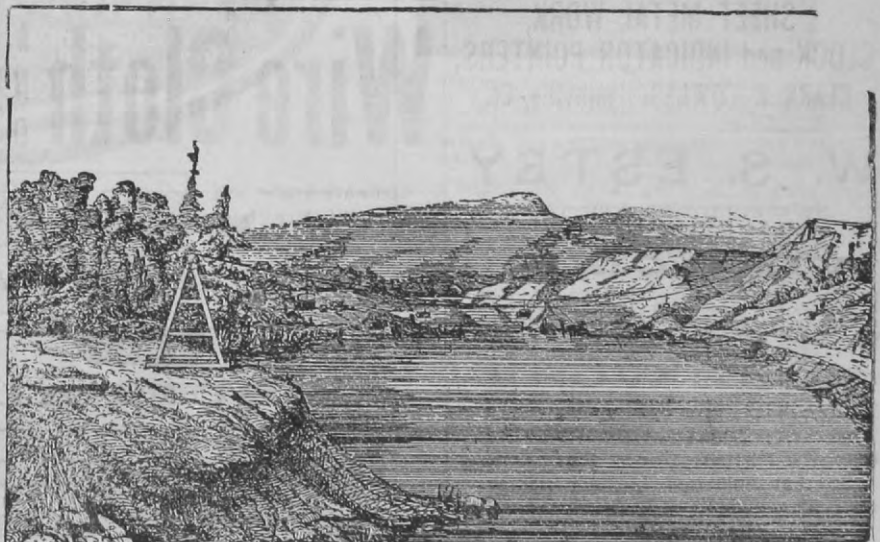
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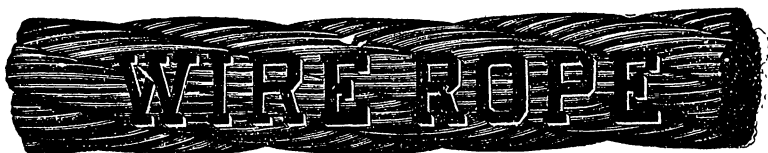
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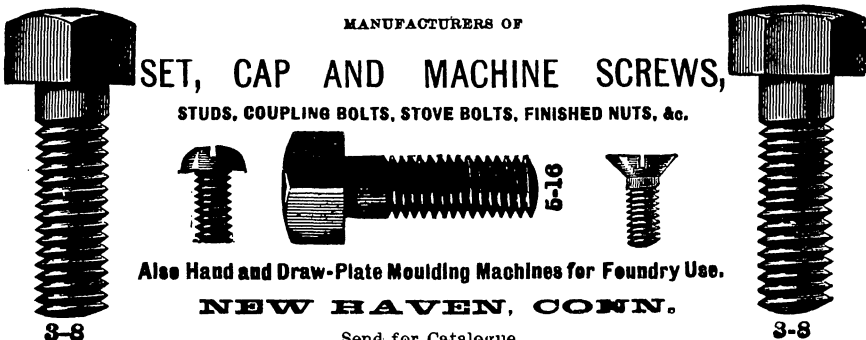


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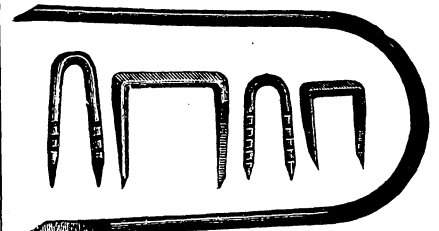
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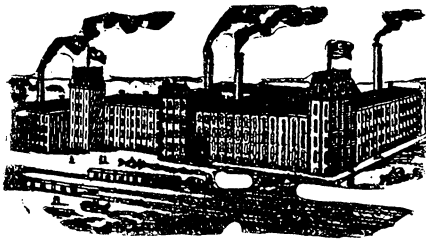
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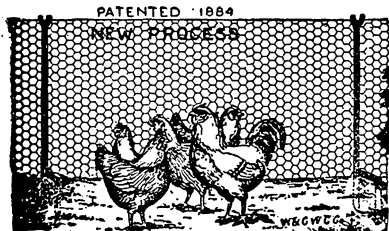
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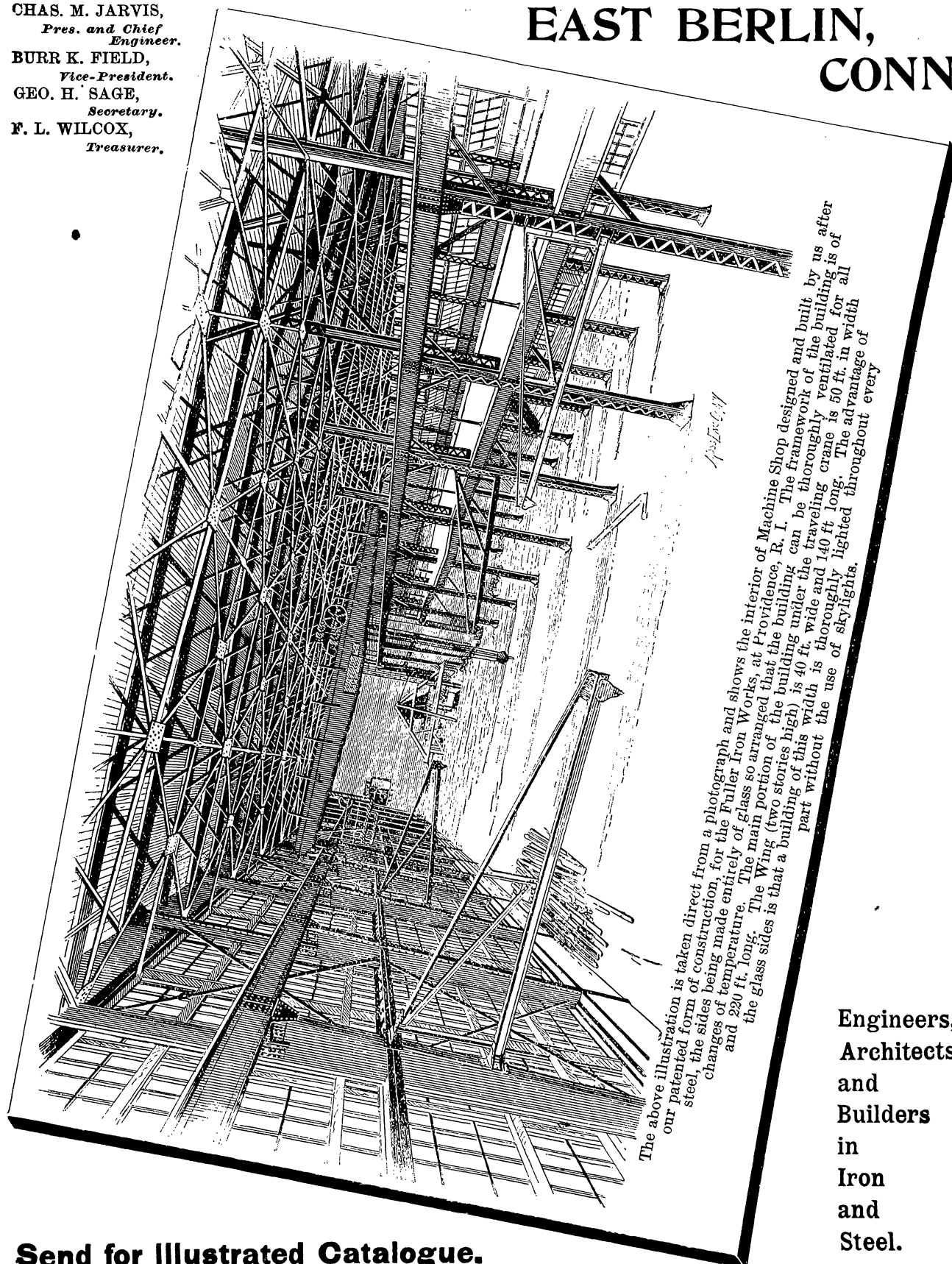
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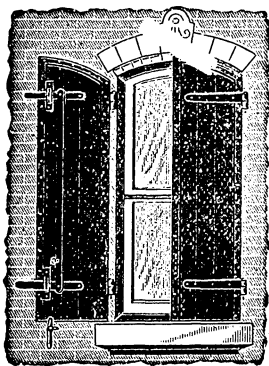
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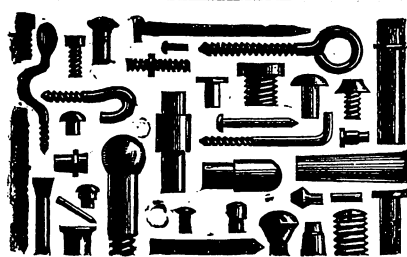
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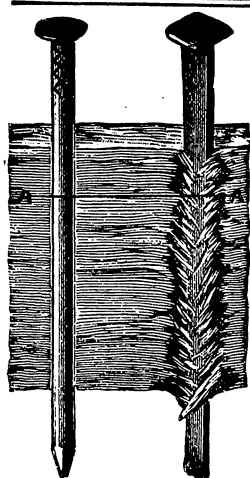
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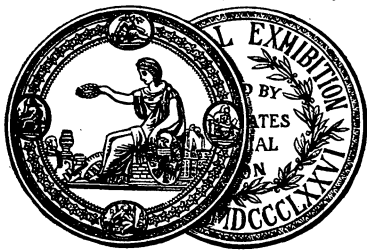
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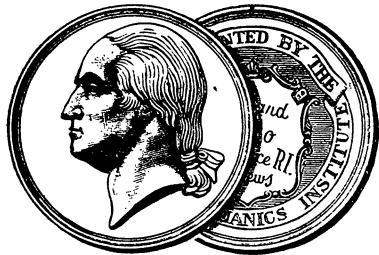
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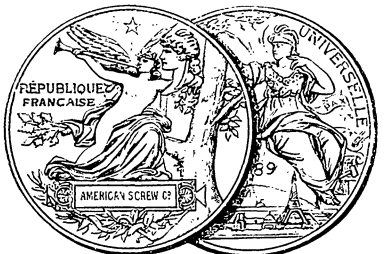
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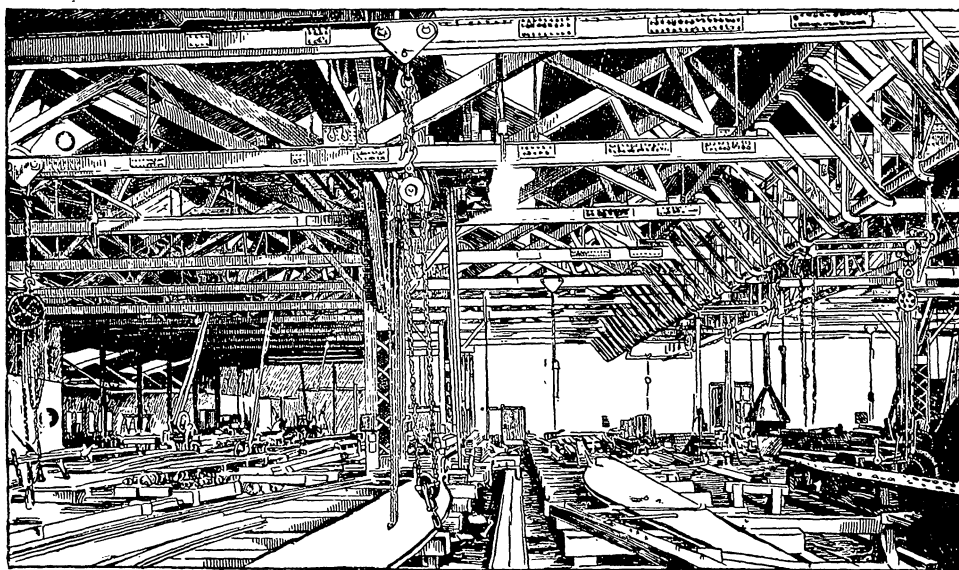
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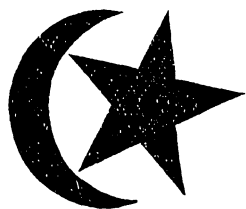
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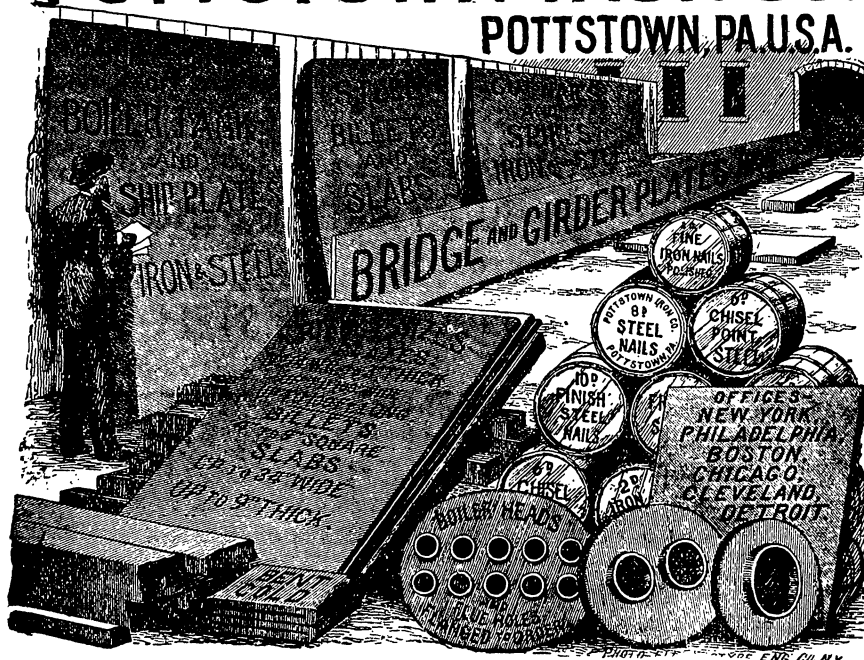
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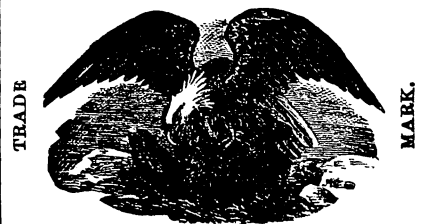
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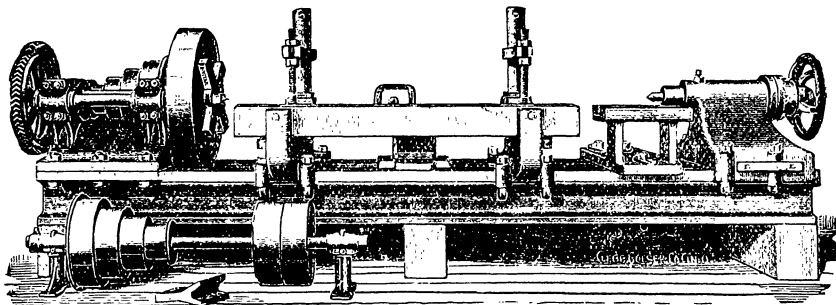
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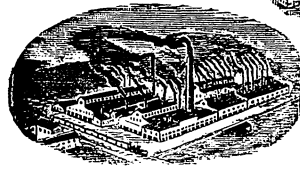
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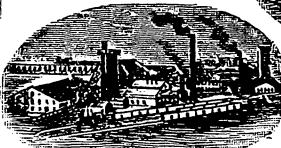
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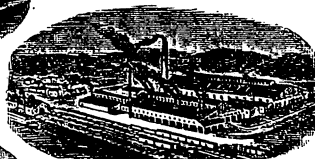
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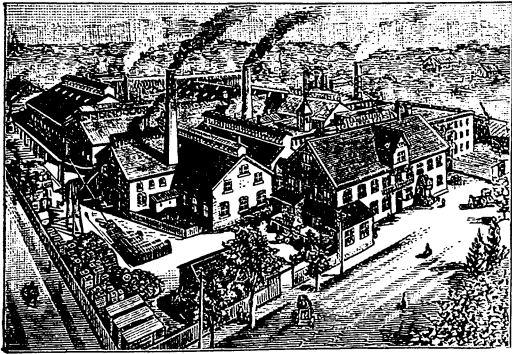
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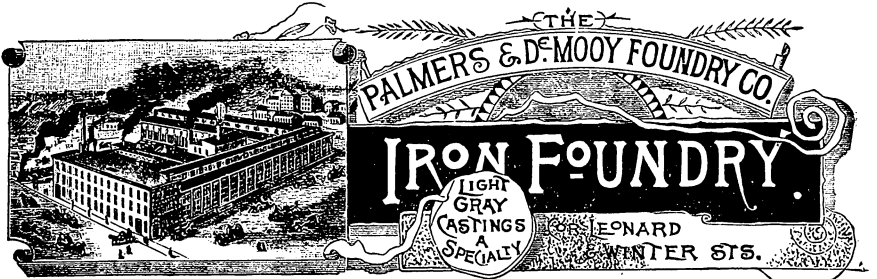
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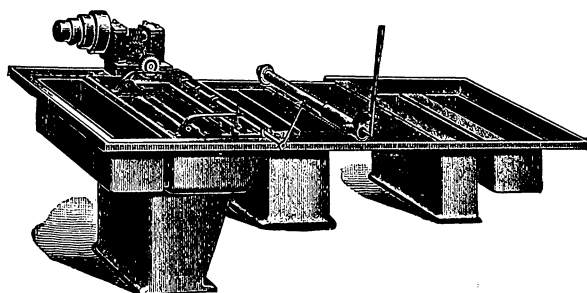
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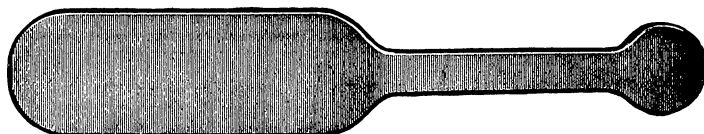
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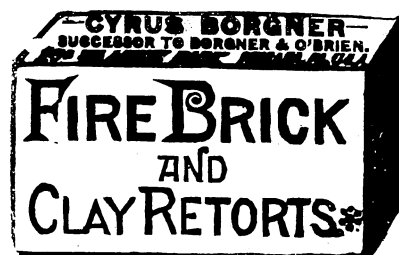
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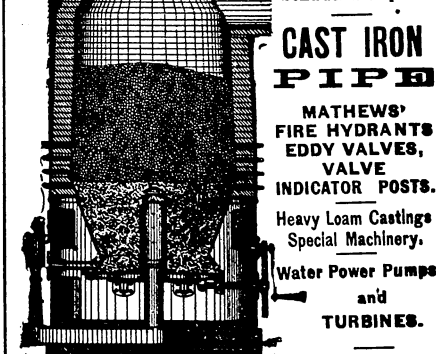
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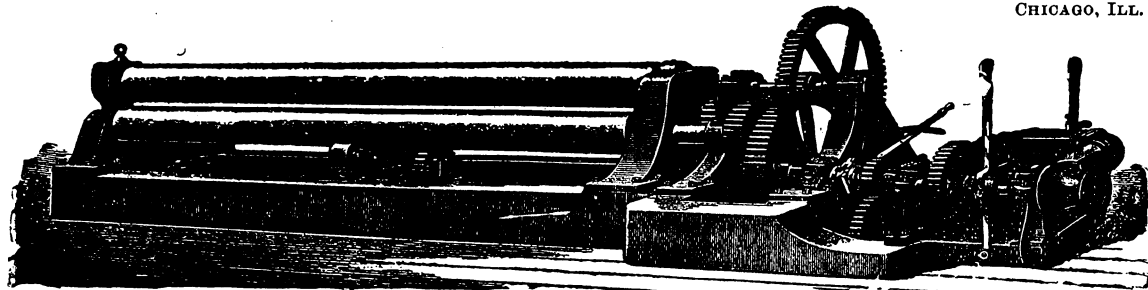
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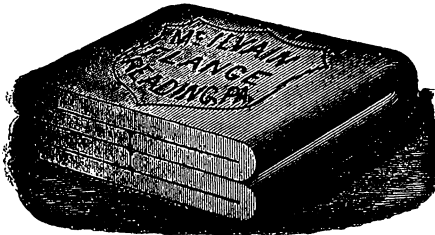
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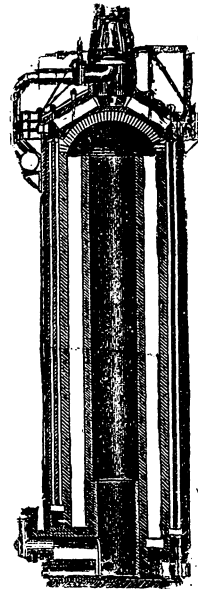
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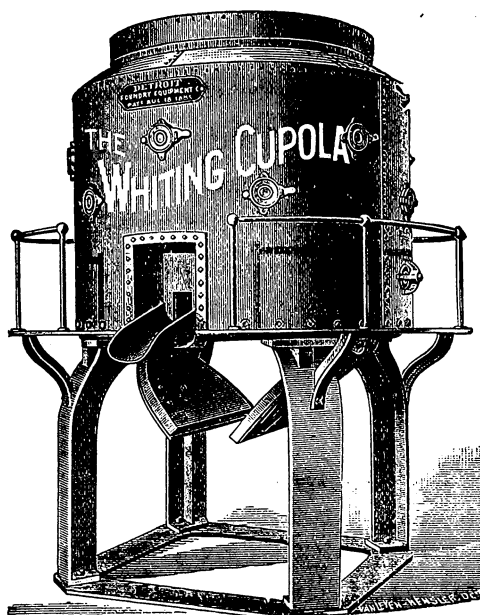
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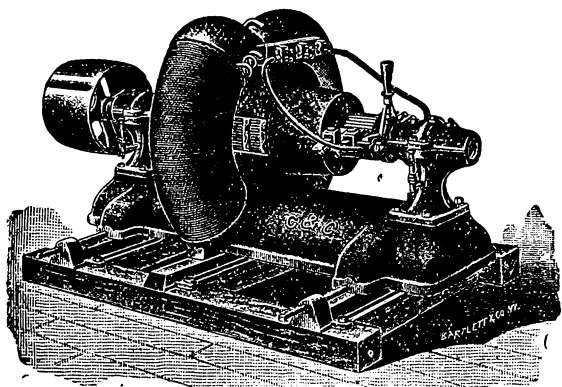
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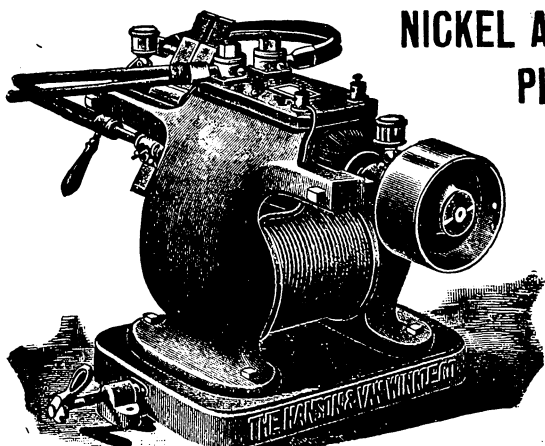
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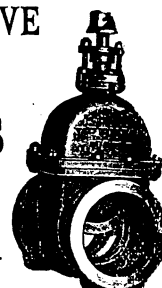
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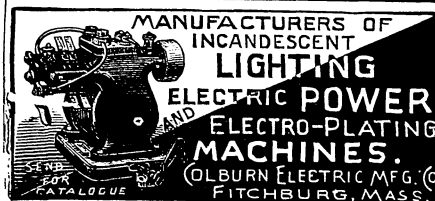
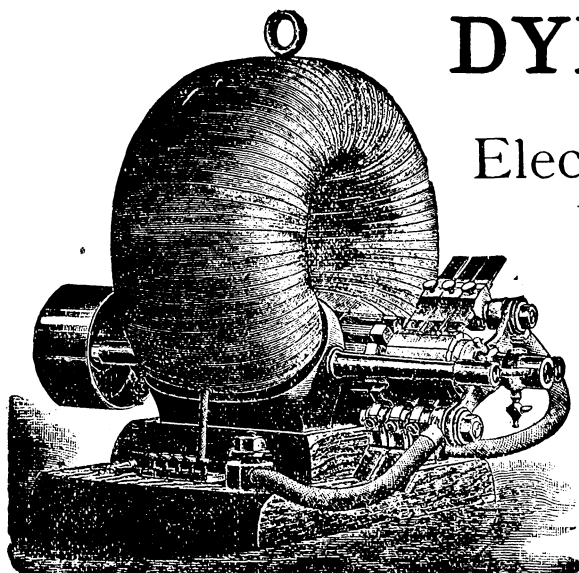
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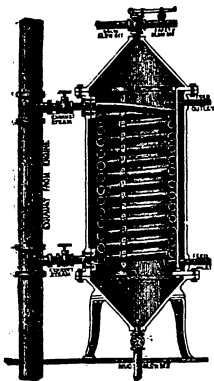
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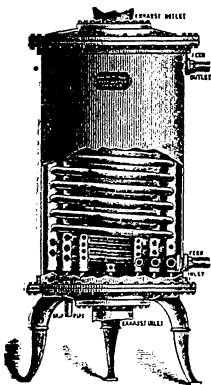
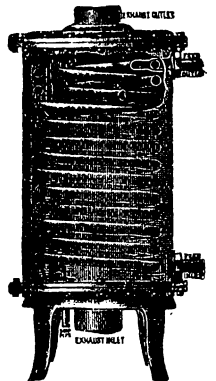
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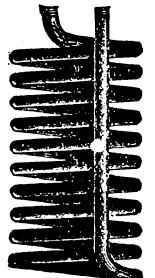
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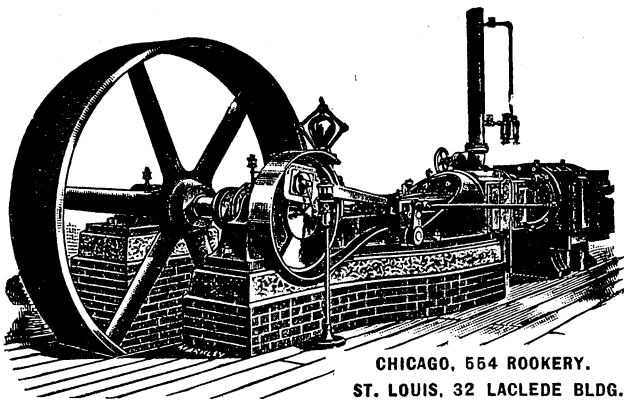
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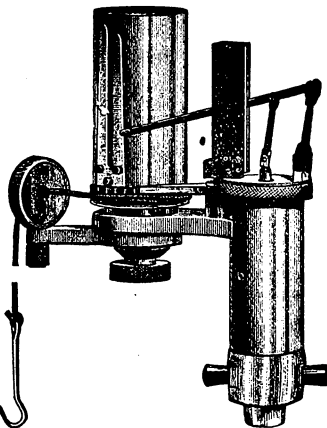
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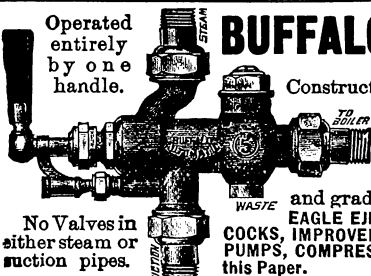
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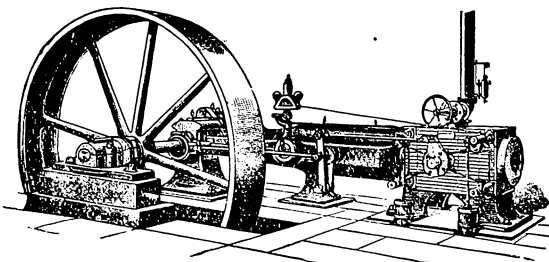
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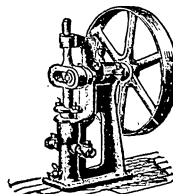
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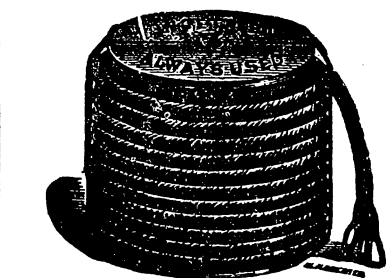
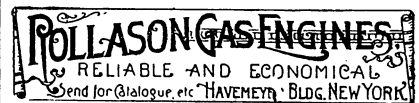
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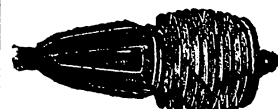
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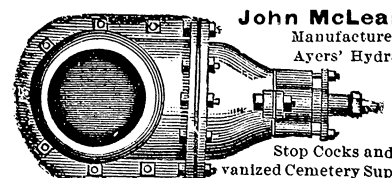
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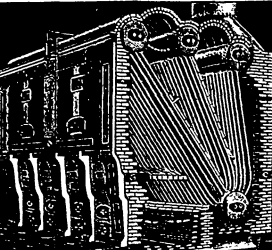


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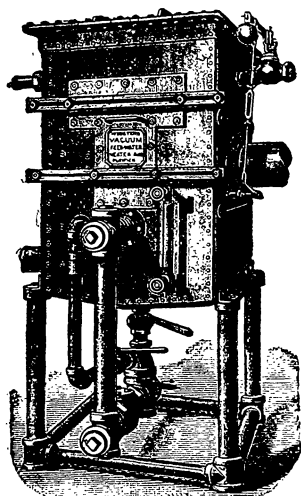
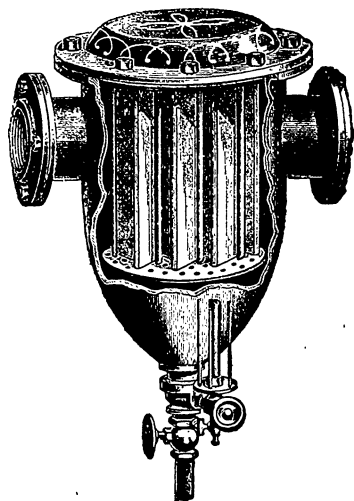
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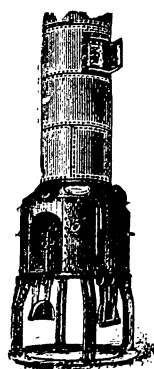
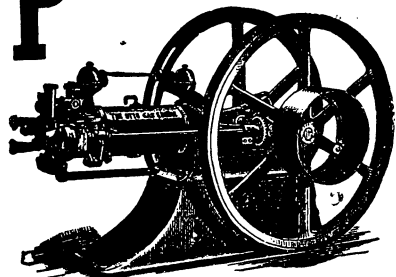
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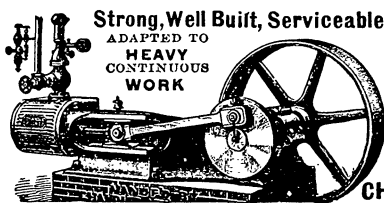
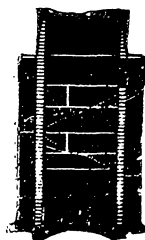
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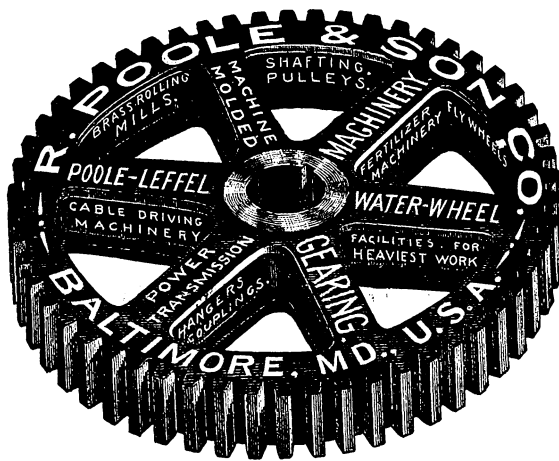
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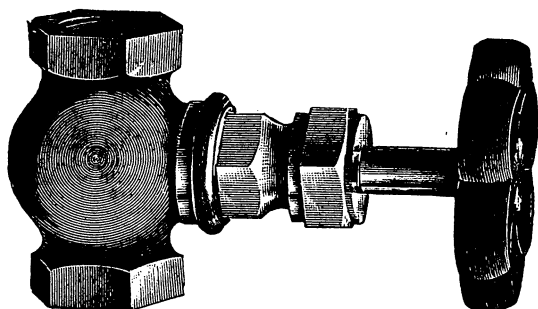
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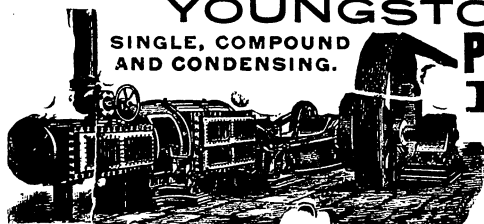
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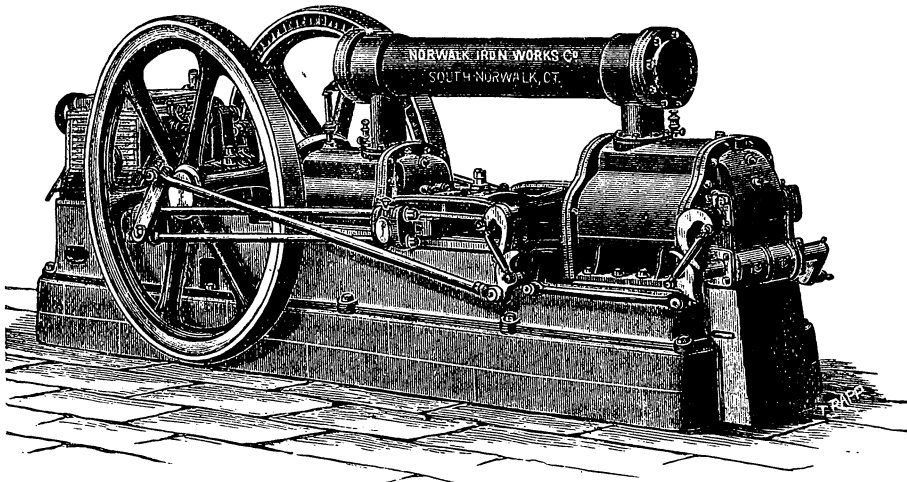
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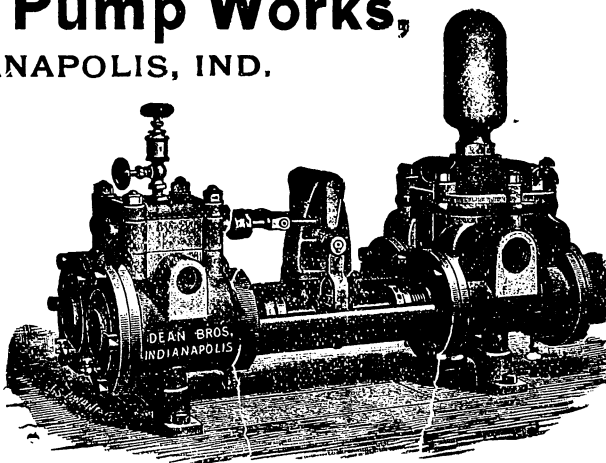
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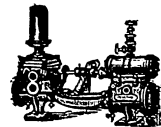
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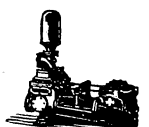
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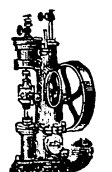


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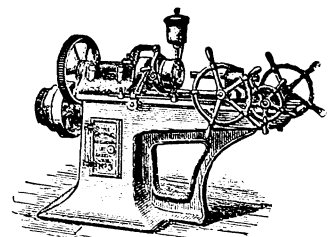
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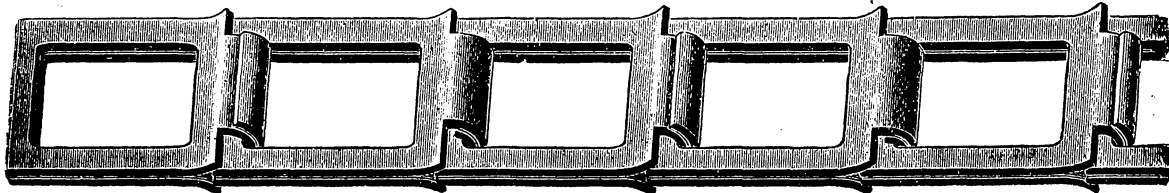
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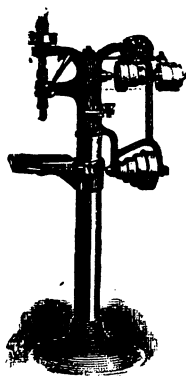
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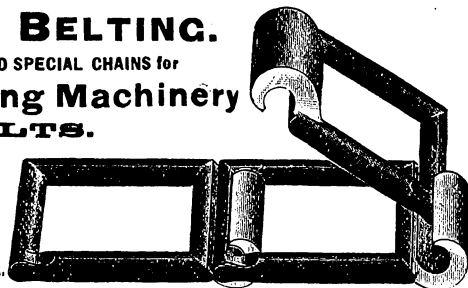
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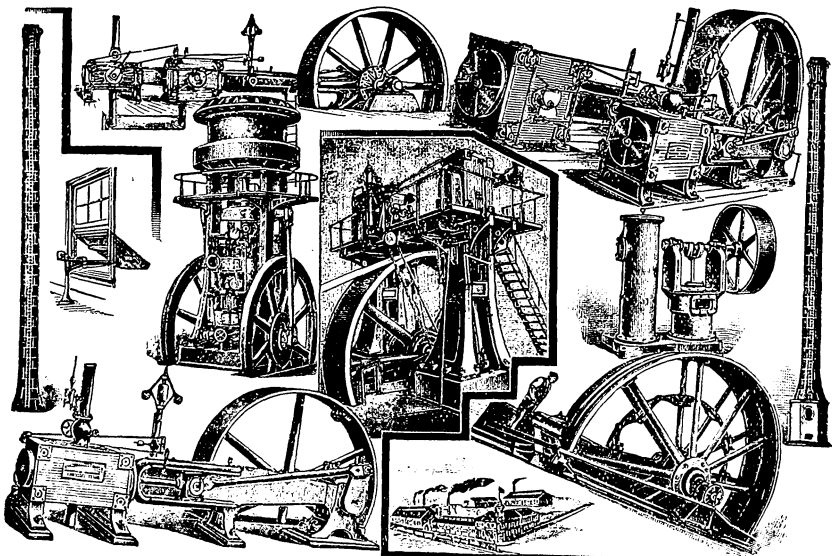
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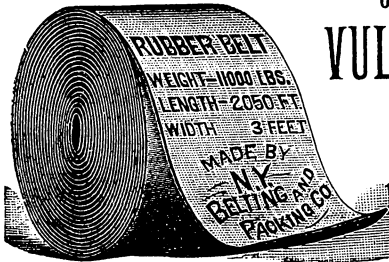
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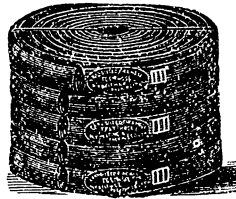
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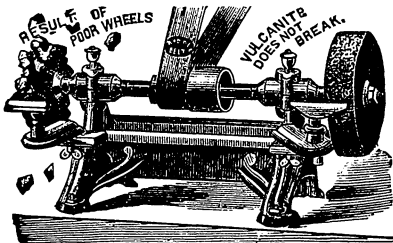
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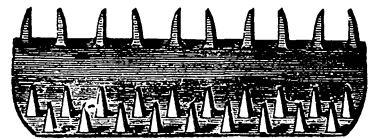
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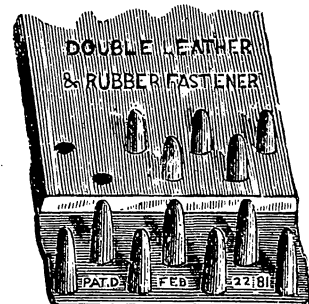
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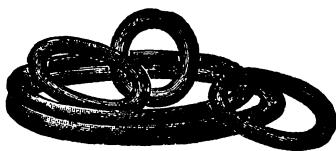
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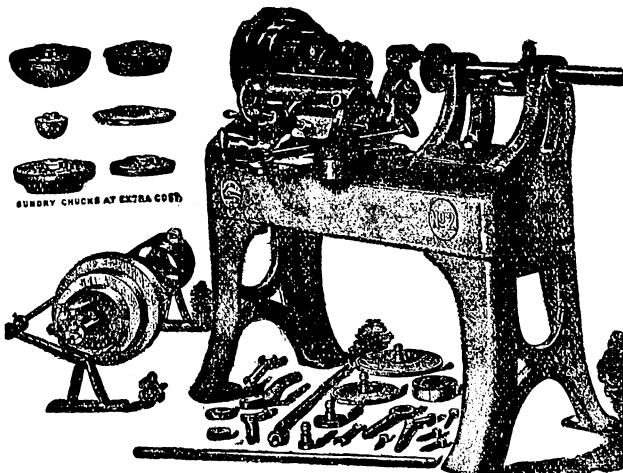
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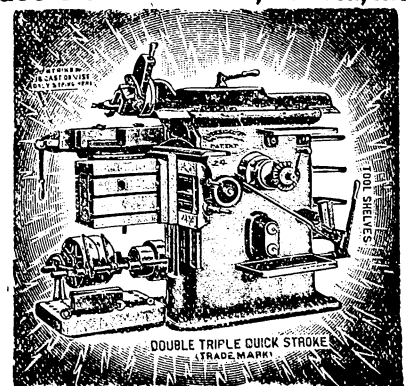


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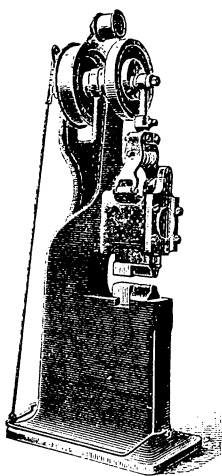
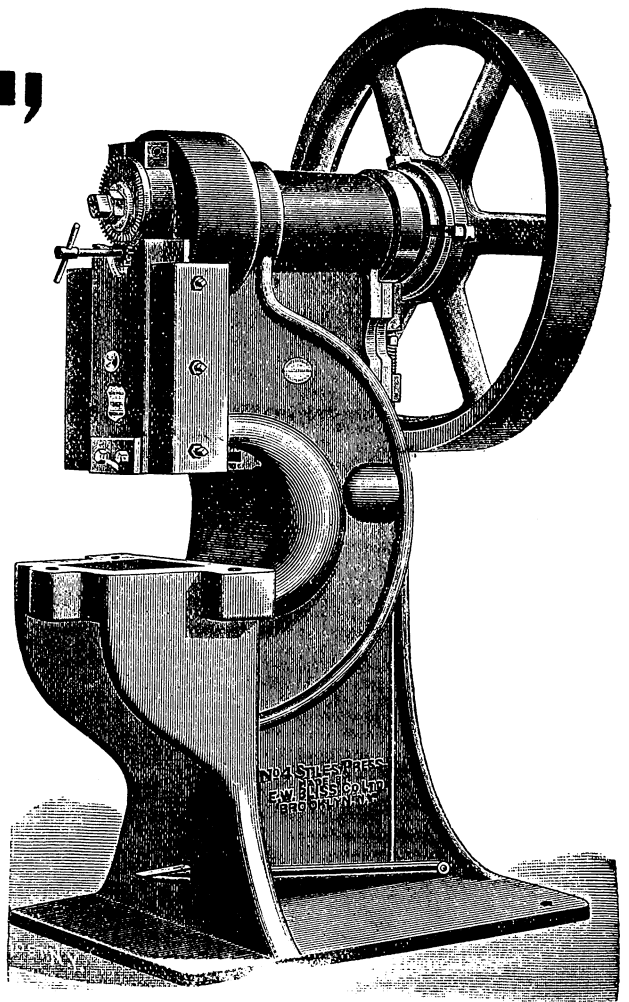
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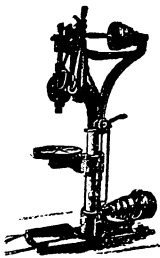
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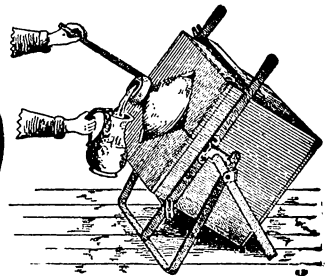
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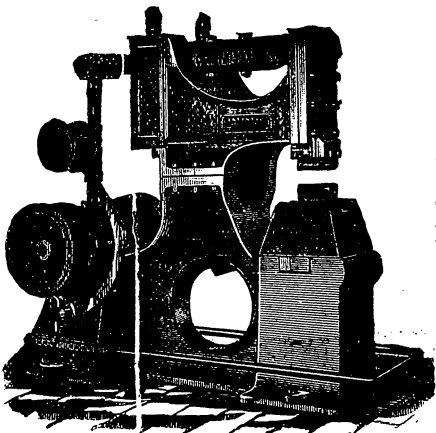
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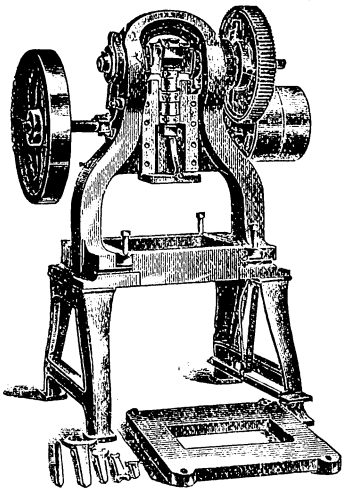
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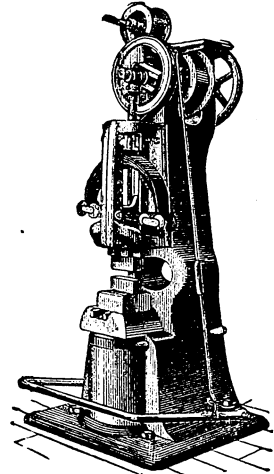
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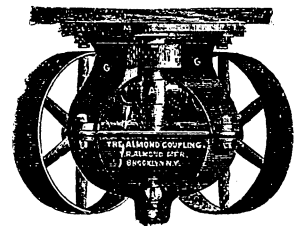
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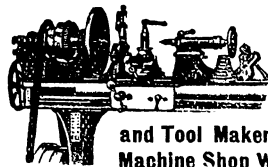


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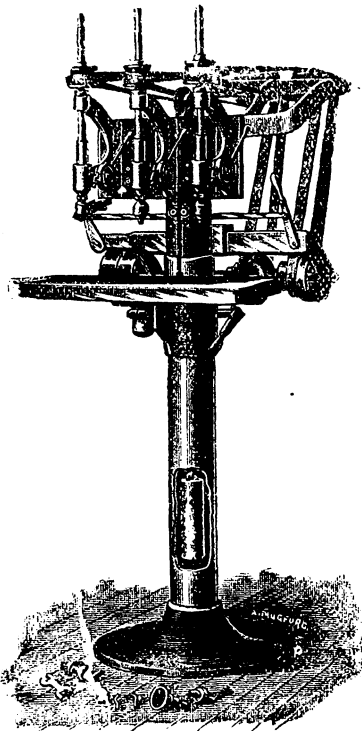
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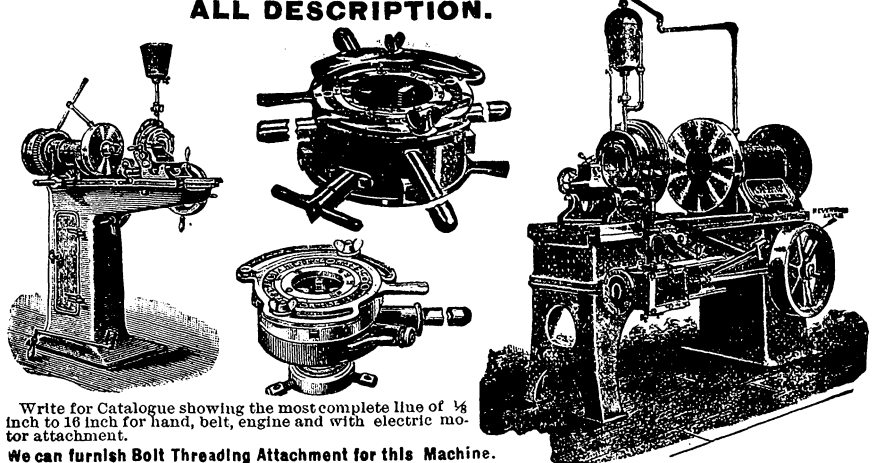


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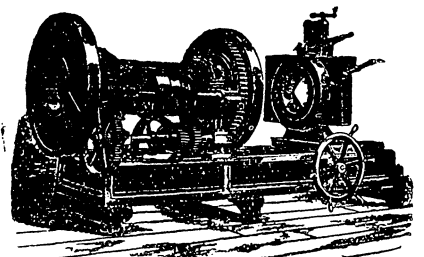
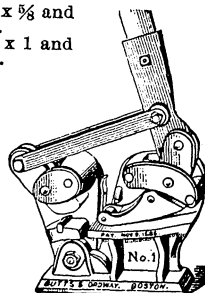
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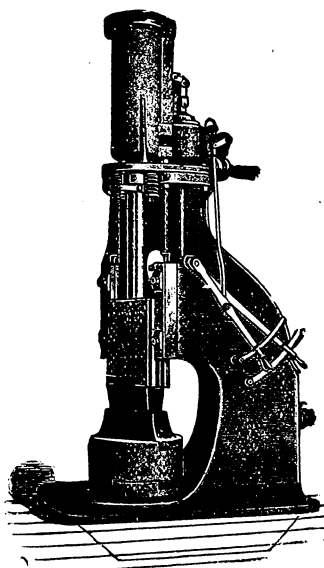
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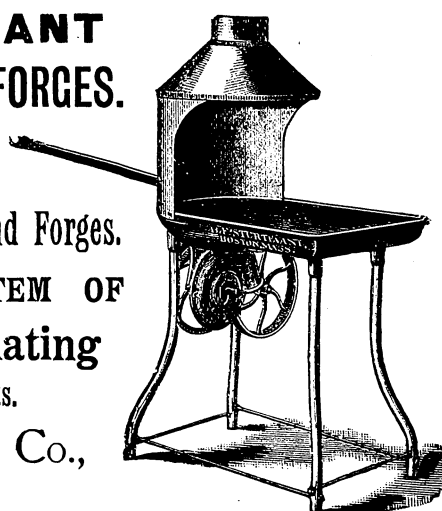
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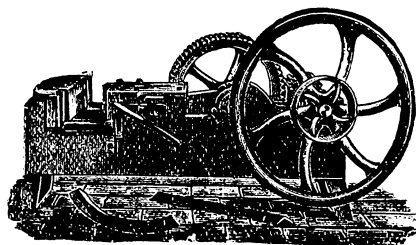
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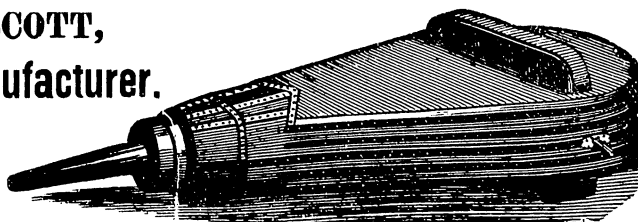
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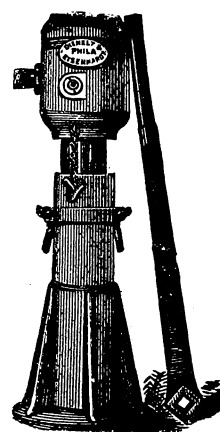
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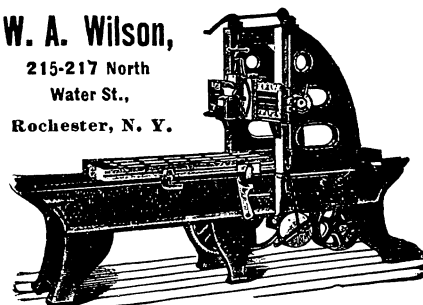
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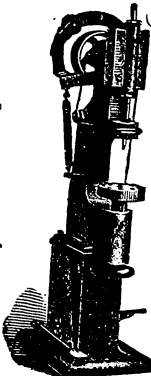
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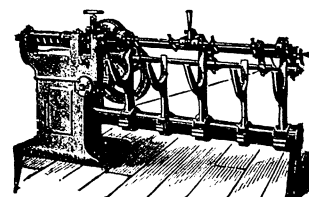
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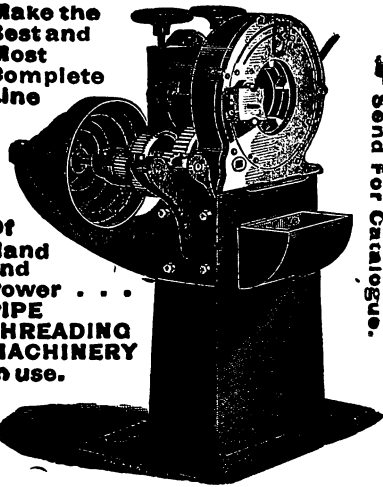
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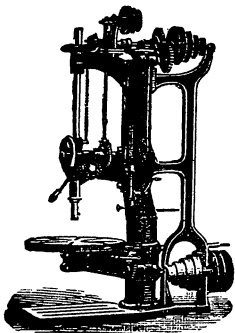


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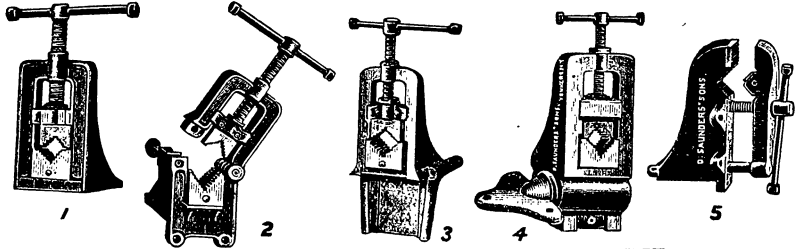
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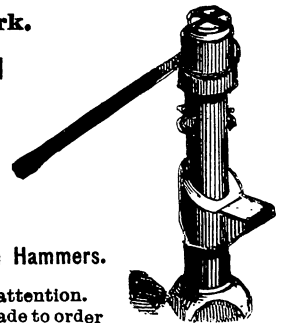
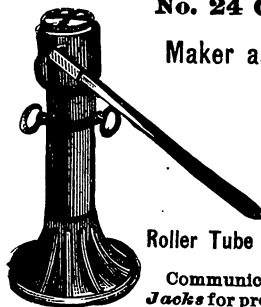
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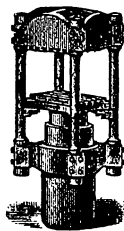
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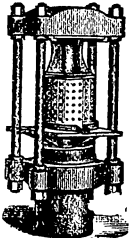
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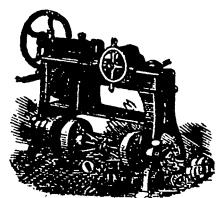


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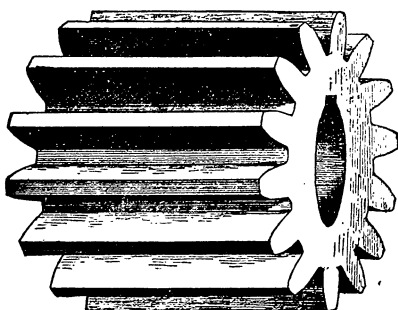
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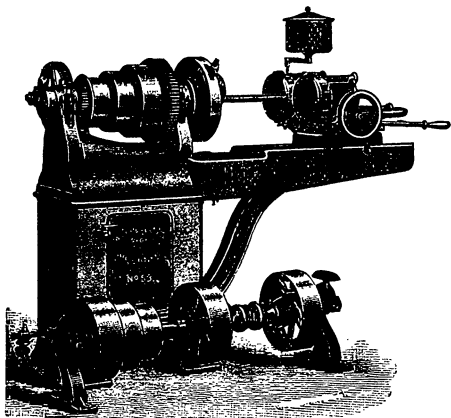
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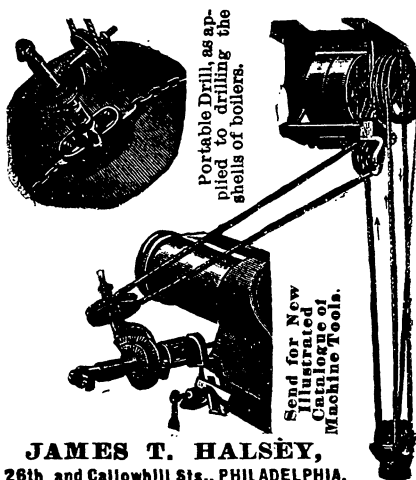
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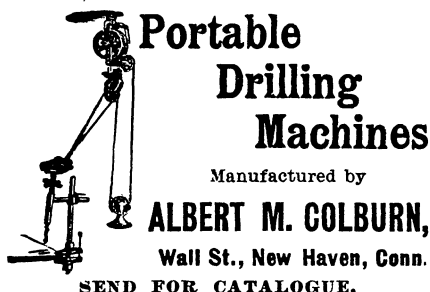
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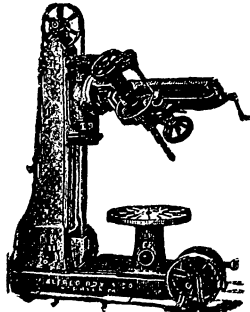
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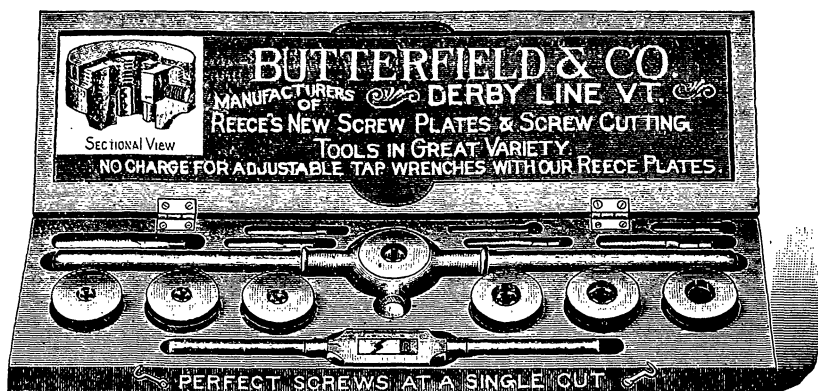
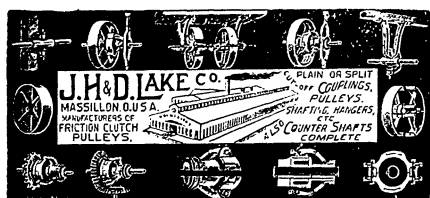
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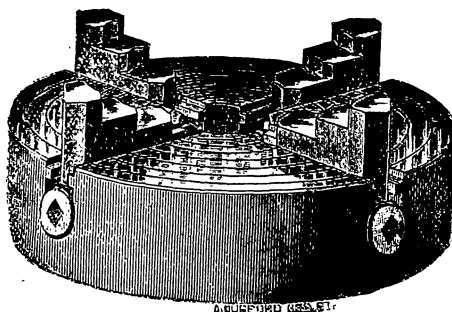
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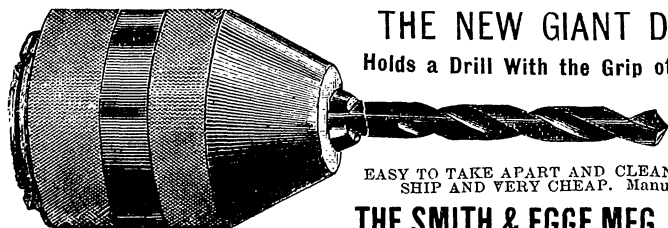
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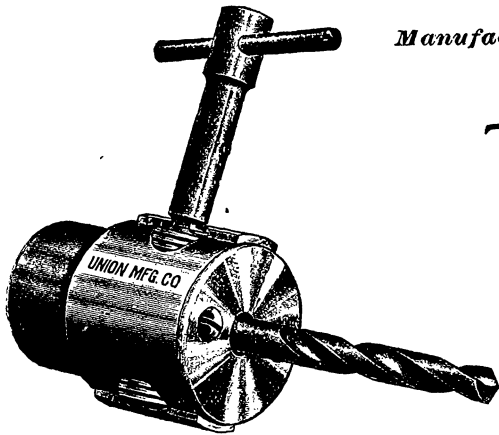
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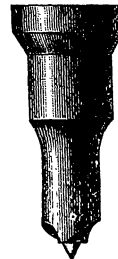
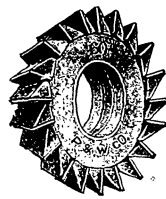
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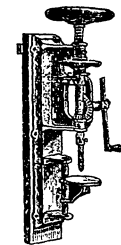
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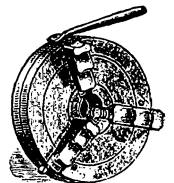
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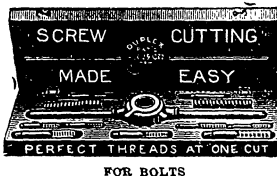


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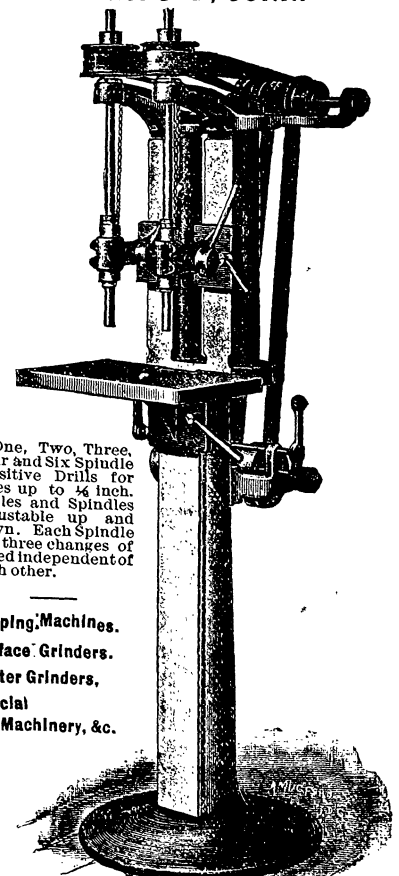
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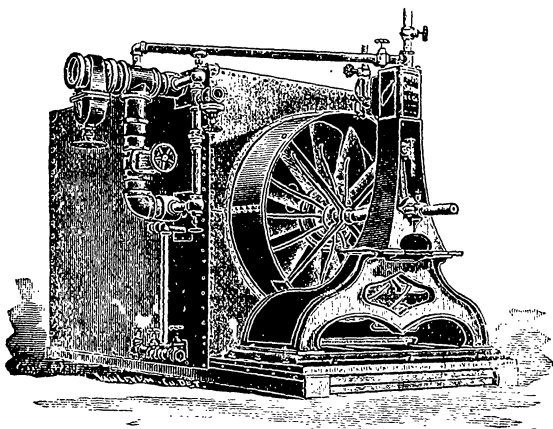
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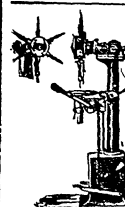
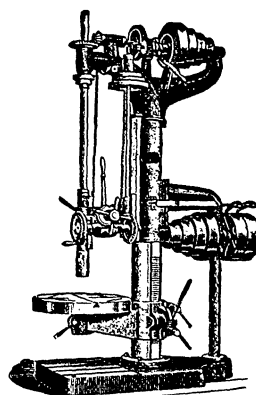
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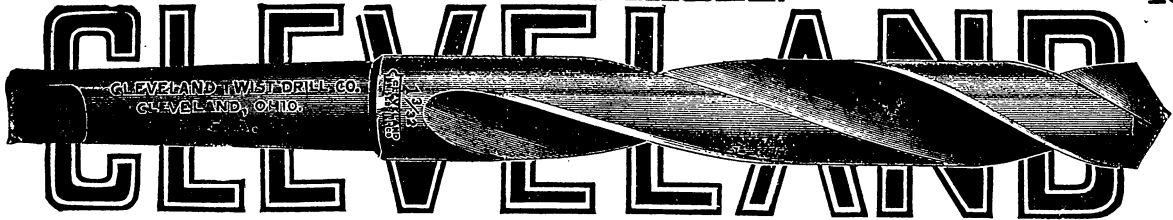
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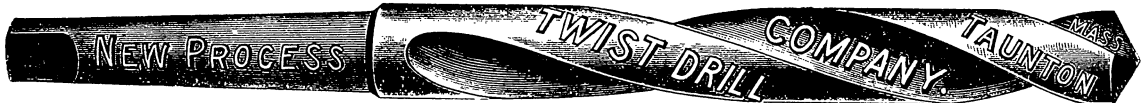
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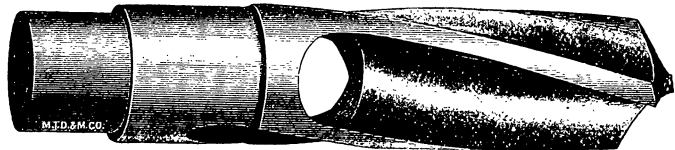
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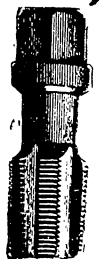
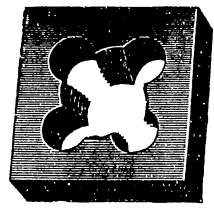
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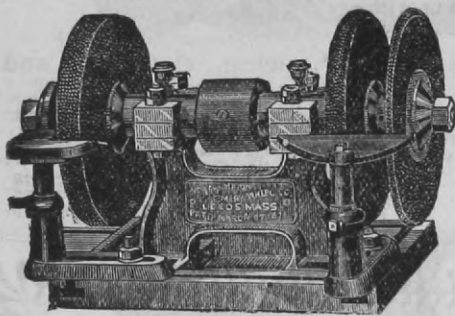
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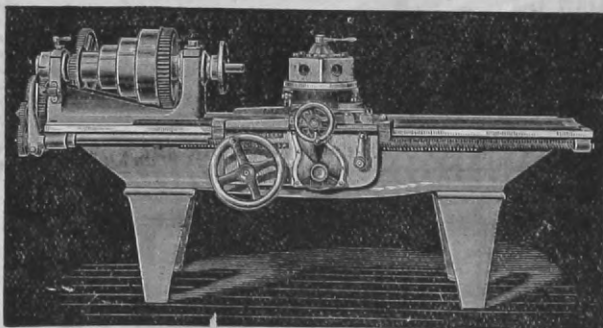
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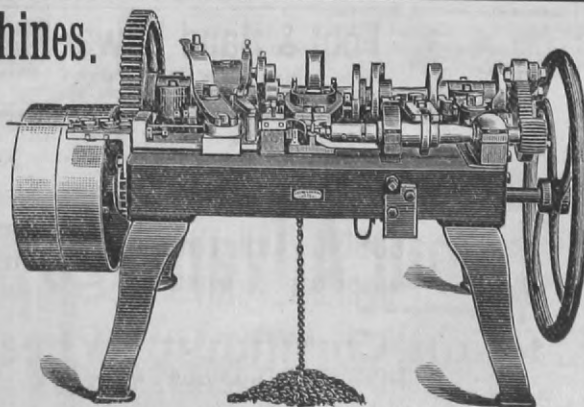
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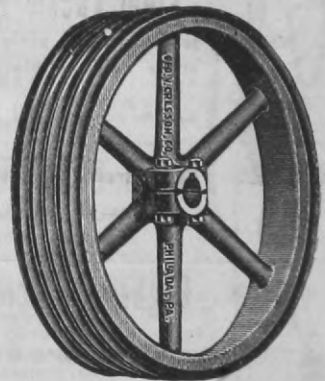
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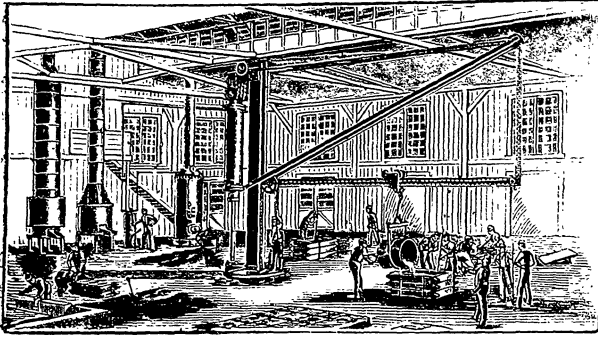
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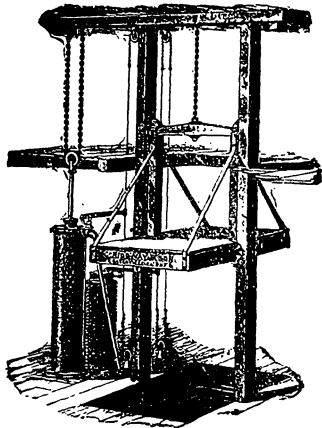
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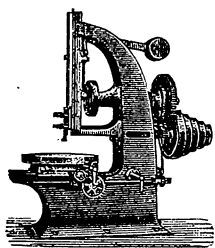
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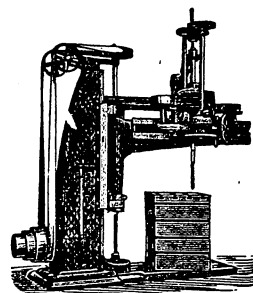


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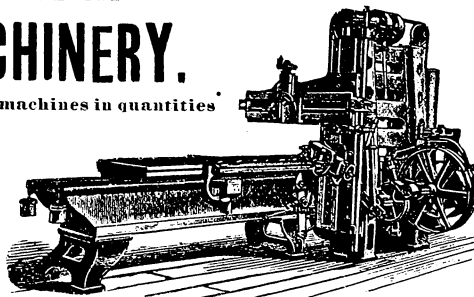
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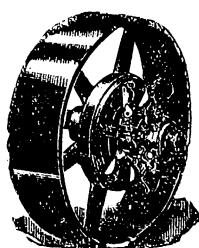
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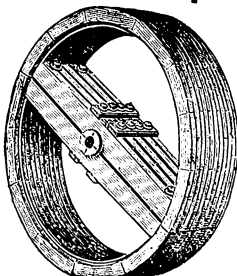


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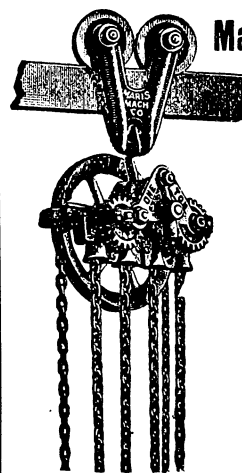
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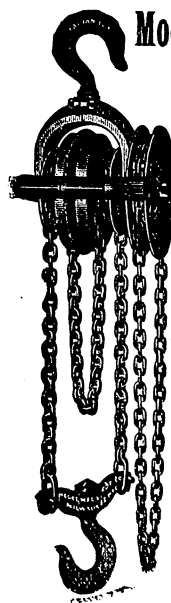
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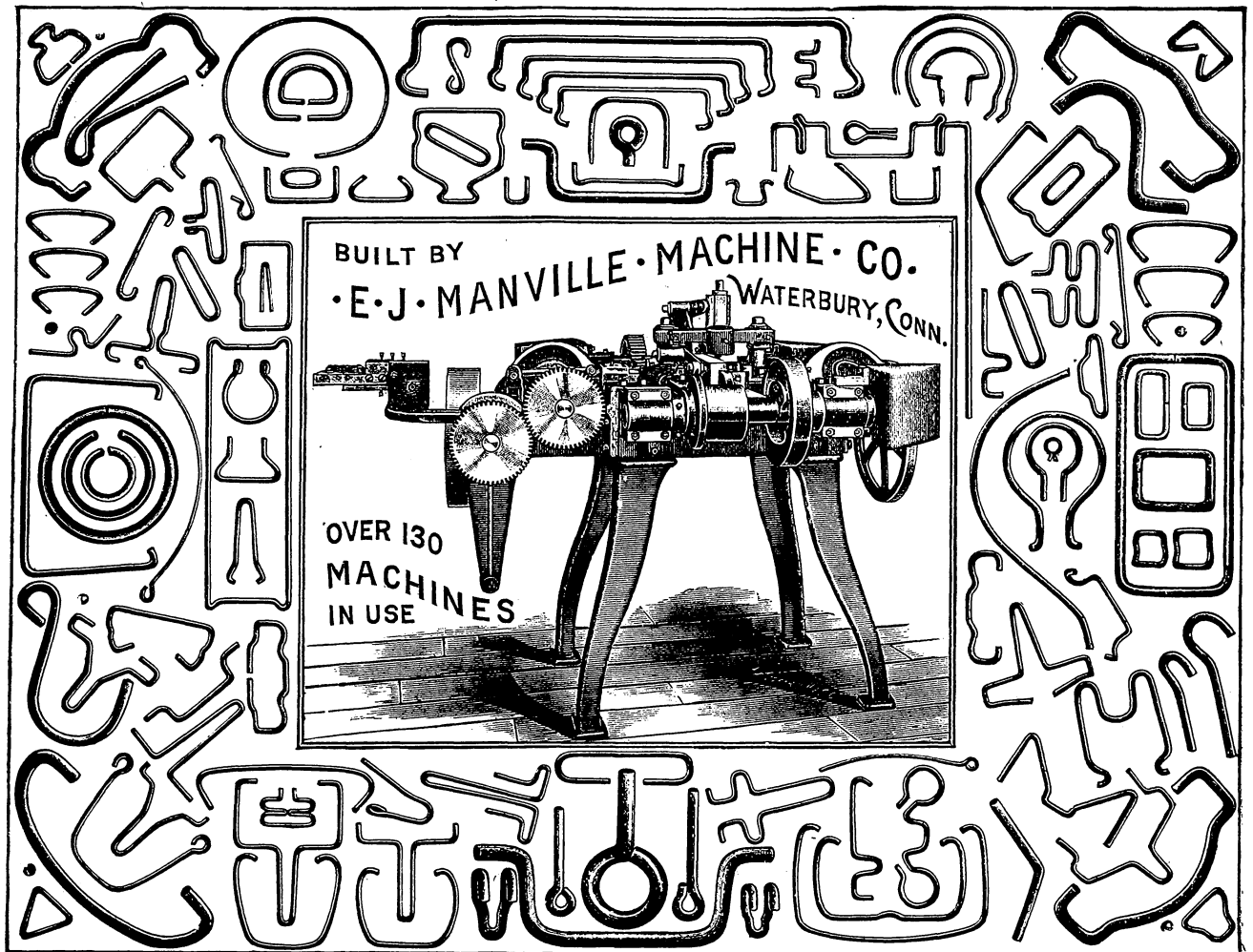
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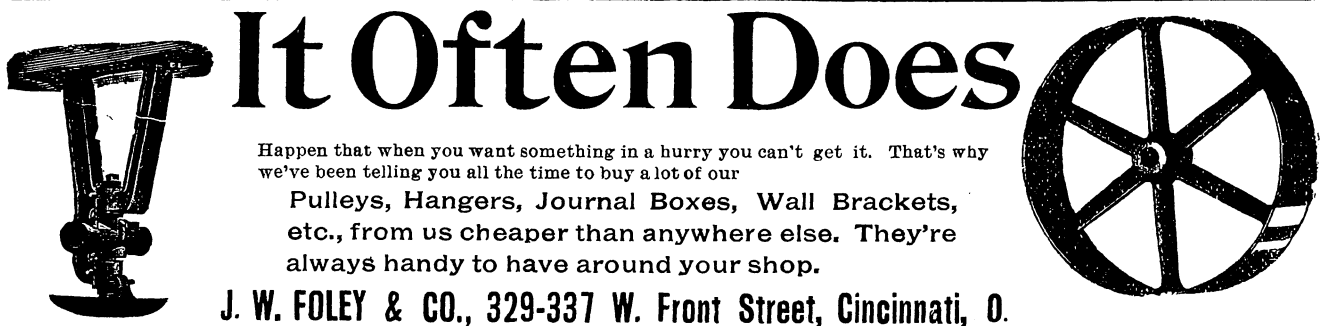
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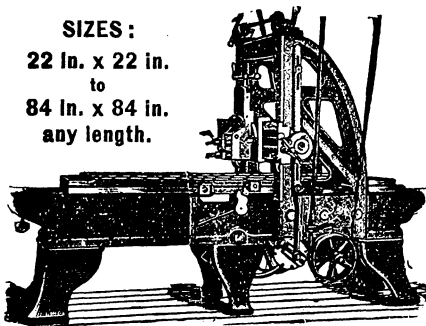
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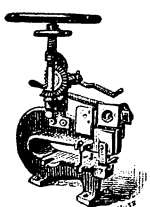
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 housings. Top Roll 11 inches, Bottom Rolls
11 inches, Dia., Hinged Housings.

Geo. Place Machine Co.
Warehouse, 511 & 513 West 13th St.
Office, 120 Broadway, New York.

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MACHINERY

ADDRESS US.

Pennsylvania Mch. Co., Ltd.,

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Machinery,

Second-Hand and New, on Hand.

No. 4, 3, 2 Stiles Punch Presses.
No. 1 1/2 and 0 Fowler Punch Presses.
No. 1 and 2 3-Screw Machines, Pratt & Whitney.
No. 1 Profiling Machine, " "
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15 x 5 Eng. Lathe, Taper Attch., " "
18 x 5 x 6 Eng. Lathe, Bridgeport Mch. Tool Wks.
200 lb. Drop Hammer, Bliss.
Magnetic Separating Machine, Dynamo for Electro-
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Machines, all Sizes.
Engine Lathes from 11 inch Swing to 90 inch Swing.
Drill Presses, Regular, from 10 to 44 inch Swing.
" Radial, H. & Jones, 48 "
Gang Drills, 2 Spindle and 4 Spindle.
Lot of Special Drills for Butt Drilling.
Special Butt Milling Machine.
No. 12 Turret Lathe, 3 1/2 inch hole, Jones & Lamson.
No. 12 " " 24 inch Swing by 8 ft. Bed, Am.
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Lot of Polishing Mch., Leather Covered Wheels, etc.
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Boiler Shop Outfit of Machinery.

Send for our latest list or state what is
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32-INCH UPRIGHT DRILL PRESS.

TWO OF THEM; SECOND HAND.

Makers' Name, KERKHOFF & CO.
Height, 8 ft. 2 in.

Greatest Distance Spindle to Base Plate, 52 in.

Greatest Distance Table to Spindle, 38 in.

Weight complete, 2600 lbs.

Back Geared and Power Feed, Quick Return,
Balanced Spindle; Shafts and Studs made of
Steel.

THE SCRANTON SUPPLY & MACHINERY CO.,
SCRANTON, PA.

For Sale, Very Low for Cash.

500 tons Relaying Steel Street Rails,
side bearing, 35 to 47 lb. sections. Also
65-lb. Steel T's.

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SEE HERE!

1 each Garvin No. 2 & No. 4 Milling Machines, 2d hand.
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1 Muller 16 x 6 Engine Lathe, 2d hand.
1 F. E. Reed 16 x 8 Engine Lathe, 2d hand.
1 Lodge & Davis 17 x 6 Engine Lathe, 2d hand.
1 Pratt & Whitney 19 x 6 Engine Lathe, 2d hand.
1 Lodge & Davis, 21 x 8 Engine Lathe, 2d hand.
1 Dietz Gang 22 x 8 Engine Lathe, 2d hand.
1 New Haven 28 x 8 " "
1 Dietz Gang 80 in. Radial Drill, " "
1 20 in. Lever Drill, new.
1 each Lodge & Davis 15 in. and 20 in. Shaper, new.
1 Steptoe 26 in. Geared Shaper, new.
1 Gear Cutter, will cut up to 40 in., 2d hand.
1 Baker Bros. Universal Saw Bench, new.
A full line of the most improved Turret Lathes, and
Pulley Machinery, also Motor Gear Cylinder Boring
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THE LODGE & SHIPLEY MACHINE TOOL CO.,
107-113 Culvert St., Cincinnati, Ohio.

FOR SALE.

2 Double Deck Boilers about 40 H.-P. each,
cheap. Hoisting Engine. Cylinder Boilers for
Stacks, 30, 36 and 42 in. diameter. Round and
Square Iron Tanks. Blow Offs. 5 Brass Can-
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order. All kinds of Scrap Iron and Metals on
hand.

BUSSENIUS & CUNLIFFE,
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FOR SALE.

Corliss Engine and Boilers for sale, nearly
new, 250 H.-P., also a 20 in. x 36 in. Wright Auto-
matic Engine, and a large assortment of Bundy
Radiators, Quarry Pumps, Boilers, Engines
and miscellaneous Machinery.

WILSON & ROAKE,

Front and Dover Sts., New York City.

Great Bargains.

**Must be Sold and
Removed.**

16 in. x 30 in. Horizontal Engine.
18 in. x 36 in. Horizontal Engine.
24 in. x 36 in. Horizontal Engine.
19½ in. x 48 in. Beam Engine, with
Knowles Condenser.

Write us for what you want.

LOVEGROVE & CO.,

Third and Quarry Sts., Philadelphia, Pa.

SECOND-HAND MACHINERY.

One American Tool Co.'s No. 2 Cabinet
Turret Lathe, with slide rest. In fine
order.

One Pratt & Whitney 36-in. Gap Chuck-
ing Lathe.

One Pratt & Whitney No. 3 Lincoln
Milling Machine.

One Iron Planer, 52 in. wide, 44 in. high,
12 ft. long, with two heads.

One Springfield Universal Grinding Ma-
chine No. 3, swing 18½ in. over the
ways and take 6 ft. between centers.
Has been used but a very few times and
is practically new.

One L. W. Pond Gear Cutter, to cut gears
36 in. diameter, 5 in. face, also ar-
ranged for cutting beveled gears

One Bullard Screw Cutting Engine Lathe,
16 in. swing, 12 ft. bed. In good order.

HILL, CLARKE & CO.,

156 Oliver St., Boston, Mass.

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SECOND HAND MACHINE TOOLS.

HAND LATHES.

3 10 in. Garvin.
3 12 in. Garvin.
1 10 in. Reed.
3 20 in. x 8 ft. Ames.
1 20 in. x 6 ft. Gould &
Eberhardt.
2 22 in. x 8 ft. Ames.

TURRET LATHES.

1 15 in. x 5 ft. Jones &
Lamson.
1 15 in. x 5 ft. Lodge &
Davis.
1 15 in. x 5 ft. Hendey

MILLING MACHS.

1 No. 1½ Garvin.
1 No. 5 Brainerd.
2 No. 2 Garvin.
4 No. 1 Pratt & W. Lin-
coln.
1 F. E. Reed Lincoln.
1 No. 4 Garvin, Rack
Feed.
1 Merritt Heavy Back
Geared.
1 No. 3 Brainerd Stand-
ard Universal.

SCREW MACHS.

27 No. 00 Garvin W. F.
1 No. 1 Garvin W. F.
2 No. 2 Garvin W. F.
1 No. 2 Brown & Sharpe.

Also, a large number of other machines. Write for
complete list and detail description.

THE GARVIN MACHINE CO.,

Laight & Canal Sts., New York

WANTED.

A good modern second-hand Planer, 48 in. x
48 in. x 16 ft. Address, with particulars,
F. P. LANNON,
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WANTED.

To furnish reasonable estimates on specialties
in light metal work.
CLARK & COWLES, Plainville, Conn.
Manufacturers of Clock Trimmings, Rivets,
Springs &c.

ATTRACTIONS FOR 1894.

1 100 H.-P. Horizontal Tubular Boiler.
1 50 H.-P. Portable Boiler. Nearly new.
1 30 in. x 30 ft. Cylinder Boiler.
2 12 H.-P. Upright Boilers.
1 75 H.-P. Plain Slide Valve Engine. Fine.
1 80 H.-P. Wright Poppet Valve Engine.
1 20 H.-P. Plain Slide Valve Engine.
1 12 in. x 7 in. x 14 in. Epping & Carpenter Pump.
1 10 in. x 6 in. x 10 in. Dean Bros. Pump.
1 10 in. x 5 in. x 12 in. Niagara Pump. Solid
Brass.
1 8 in. x 5 in. x 10 in. Delamater Duplex Pump.
5 7 in. x 3½ in. x 7 in. Cameron Pumps.
All in fine order and very cheap

THOS. P. CONARD,

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WE ARE OFFERING BARGAINS IN THE FOLLOWING PIECES OF SECOND- HAND MACHINERY.

14 x 18 High Speed Engine, 2 waxes 60 in. dia.,
14 in. face.
18 x 48 Corliss Engine, wheel 16 ft. dia., 25 in.
face.
16 x 48 Corliss Engine, wheel 16 ft. dia., 9 tons.
2 Horizontal Tubular Boilers, 5 ft. dia. x 17 ft.
long.
7 Horizontal Tubular Boilers, 5 ft. dia. x 15 ft.
long.
Smith Valve Compound Duplex Pump, 14-20 x 15
x 15.
Worthington Compound Duplex Pump, 10-16 x
10½ x 10.
Davidson Pump, 24 x 12 x 24.
500 H.-P. J. P. Witherow, Pittsburgh, Pa.,
Heater.
Edison Dynamos of 75, 150, and 300 lights, with
lamps, sockets, switches, wire, &c.

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MACHINERY, TOOLS, &c.

Engines, all sizes, Slide Valve and Automatic.
Boilers, all sizes, Horizontal, Vertical and Locomotive.
Rolling Engines, Portable Engines, Steam Pumps.
20 Screw Cutting Lathes, 12 in. to 24 in. swing.
20 Bement Milling Machines.
24 in., 30 in. and 36 in. Planers, 6 in., 12 in. and 15 in.
Shapers.
44 in. Radial Drill, 1½ in. National Bolt Cutter.
Power Shears, ½ in. iron, 15 in. Gap.
Hydraulic and Punching Presses.
10 lbs., 25 lbs., 40 lbs. hammers for belt.
4½ Pratt and Whitney cut-off machine.
Brown & Sharpe Grinding Lathe.
FRANK TOOMEY, 131 N. Third St., Philadelphia, Pa.

FOR SALE.

2 5 H.-P. Gas Engine. New.
4 H.-P. Shipman. Good as new.
8 H.-P. Horizontal. Good as new.
6 x 6 Clayton Air Compressor.
1 Steam Hammer.
1 Hand Drill.
2 9-15 Blake Crushers.
30 Grindstones 30 in. x 5 in.
1 Spike Machine (10 tons capacity daily), A1.
MANSFIELD & DUDLEY,
126 Liberty Street, New York City.

Second-Hand Rails FOR SALE.

In lots to suit, and ready for delivery.

3000 tons 60 lb. Steel T Rails.
450 tons 56 lb. Steel T Rails.
800 tons 54 lb. Steel T Rails.
400 tons 50 lb. Steel T Rails.
350 tons 48 lb. Steel T Rails.
50 tons 35 lb. Steel T Rails.
500 tons 35 lb. Iron T Rails.
250 tons 30 lb. Iron T Rails.
120 tons 30 lb. Steel T Rails.
150 tons 25 lb. Iron T Rails.
140 tons 20 lb. Steel T Rails.
40 tons 16 lb. Steel T Rails.
1700 tons Johnson Girder Rails, 38, 48, 52 and 66 lb.
Rails.

All selected and in excellent condition for relaying
and only slightly worn.
Second hand selected and sound rails furnished in
specified lengths for builders' use. For prices and
particulars apply to

JOSEPH JEWKES,
Railway Equipment, Pittsburgh, Pa.

SOME BARGAINS HERE.

1 Hendey Shaper, 15 in. stroke, imp. vise.
1 14 x 6 Screw Cutting Engine Lathe. New.
1 5 in. hole in Turret Screw Machine and Counter, \$25.
2½ Hendey Cutting-off Machine. New.
1 3-Spindle Garvin Drill Press, used 1 month.
100 H.-P. Woodbury Engine. 2d hand. Good order.
2 50 H.-P. Woodbury Boilers. Good order.
2 75 H.-P. Woodbury Boilers. Good order.
75 H.-P. Ball Engine. 2d hand. Good condition.
Also variety of Engines, Boiler Pumps, &c.
And other machinery, new and second hand. Write
for prices. **Machinery Supply Company,**
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FOR SALE.

Two 80-lb. Lever Trip Hammers, about new, first
class condition, made by Williams, White & Co.
Moline, Ill., weight about 7500 lbs. each.
One 100-lbs. Jenkins' Upright Cushioned Helve Ham-
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Belleville, Pa.
One set of small Rolls for Rolling Carriage Springs
and other light work.
All of the above at reasonable prices, or will ex-
change for medium sized Steam Hammers or large
Power Press.

DANIEL L. HEISKELL, Wheeling, W. Va.

CORLISS

and other Automatic, Slide Valve Engines,
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| CORLISS. | HIGH SPEED AUTOMATIC. | HORIZON- TAL SLIDE VALVE. | VERTICAL SLIDE VALVE. |
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| 10 x 20 | 9½ x 12 | 8 x 10 | 28 x 30 |
| 10 x 24 | 10 x 12 | 9 x 18 | 20 x 24 |
| 11 x 36 | 11 x 20 | 9 x 24 | 18 x 16 |
| 14 x 80 | 12 x 18 | 10 x 12 | 18 x 12 |
| 14 x 36 | 10 x 14 | 10 x 14 | 10 x 12 |
| 16 x 42 | 12½ x 15 | 10 x 14 | 10 x 10 |
| 18 x 36 | 15½ x 16 | 10 x 16 | 9 x 10 |
| 20 x 42 | 18 x 12 | 11 x 20 | 9 x 9 |
| 22 x 48 | SLIDE | 12 x 18 | 8 x 10 |
| 23 x 36 | VALVE HOR. | 12 x 24 | 7 x 9 |
| 28 x 48 | 24 x 48 | 14 x 24 | 7 x 7 |
| 28 x 60 | 22 x 30 | 15 x 24 | 6 x 6 |
| 30 x 60 | 20 x 48 | 18 x 36 | 5 x 5 |
| 30 x 72 | 20 x 38 | 15 x 30 | |

HORIZONTAL BOILERS, 3, 6 x 16; 8, 5½ x 16;
6, 5 x 16; 3, 5 x 18; 1, 4½ x 12 and several
others.

LOCOMOTIVE BOILERS, 15, 30, 45, 50, 60, 80,
100 and 150 H.-P.

ONE 1000 g. Duplex Fire Pump, Brennan
Crusher, Bogardus Mill, Burr Mill, Fan
Blowers, Platform Scales, etc., etc. Send
for catalogue.

G. M. CLAPP,

74 Cortlandt St., New York.

PLATE MILLS

For sale, one 2 high and one 3 high 30-inch Train, will
roll heavy and light plates up to 50 in. In complete
order. Made by Garrison & Co.
MATTHEW GILL, Jr., Philadelphia, Pa.

GUILLOTINE SHEAR.

For sale, Morgan, Williams & Co. Guillotine Shear, En-
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steel plates. (Has Auxiliary shear on back.)
MATTHEW GILL, Jr., Philadelphia, Pa.

HEAVY ENGINE.

For sale, Horizontal Engine 39 in. x 72 in.; 2
Fly Wheels weighing 53 tons each.

MATTHEW GILL, Jr., Philadelphia, Pa.

ROLL LATHE.

For sale, one heavy Roll Lathe made by Gar-
rison & Co., will take in 12 ft. Roll and turn to
40 inches. **MATTHEW GILL, Jr.,** Phila., Pa.

Heavy Plate and Bar Shears, Engines,
Boilers, Pumps, Cranes, Fairbanks Testing
Machine, &c., &c., for sale by

MATTHEW GILL, Jr.,

Philadelphia, Pa.

FLOOR PLATES.

FOR SALE.—A Superior Lot of Cast Iron
Plates 2 ft. x 4 ft. They are made to avoid warp-
ing and cracking. Will sell in lots to suit.

MATTHEW GILL, Jr.,

308 Walnut St., Philadelphia Pa.

!!! FOR SALE !!!

BAKER BLOWERS, Nos. 3, 4, 4½, 5, 5½, 6, 7 and 7½
ROOT BLOWERS, Nos. ½, 1, 2, 3, 5, 6 and 7.
Buffalo Blowers and Heating Apparatus.
1 Corliss Hand Wheel, 12 ft. x 24 in., in halves
1 No. 9 CLAYTON DUPLEX AIR COM-
PRESSOR, 22 in. Steam x 24 in. Air x 30 in.
Stroke. Bargain.

A Variety of Machinery, very cheap.
Do you want to buy or sell Machinery? If so, write
C. R. BIGELOW, Machinery Expert,
45 Dey St., New York City.

LIST OF ODD MACHINERY.

For Sale Cheap.

1 "Bement" Foundry Cupola, 6
tons capacity. 1 "Peck" Drop
Hammer and Lifter, 200 pounds.
1 small Trip Hammer, 700 blows
per minute. 1 Milling Machine.
10 Foundry Rumpers, 9 in., 16 in.
and 22 in. 1 Polishing Rumbler,
22 in. x 4 ft. 2 Vertical Tubular
Boilers, 48 in. x 9 ft. 1 Horizontal
Engine, 22 in. x 60 in. stroke. 15
Cylinder Boilers, 36 in. diameter,
different lengths. 4 Porter-Allen
8 x 16 High Speed Engines. Also
1 Blast Furnace Blowing Engine.
1 16-in. Train of Rolls. Rotary
Squeezer, Shears, &c. For prices
write **G. W. SCHULTZ & CO.,**
308 Walnut St., PHILADELPHIA, PA.

FOR SALE, CHEAP.

One pair of Greene Cut-Off Engines, 250 H.-P.
(125 H.-P. each), 18 x 48 in., 14 ft. x 30 in. fly
wheel. All in good condition. Have been run-
ning up to date. Address

WINCHESTER REPEATING ARMS CO.,
New Haven, Conn

SECOND-HAND MACHINERY.

4 11 in. x 5 ft. Engine Lathes, Reed and Prentice.
 2 12 in. x 5 ft. Young Speed Lathes.
 2 15 in. x 6 ft. Reed Engine Lathes, R. & F. & P. R.
 6 16 in. x 6 ft. Engine Lathes, Young, Reed, Blaisdell and Flather.
 2 18 in. x 8 ft. Engine Lathes, New Haven and Dustin.
 4 20 in. x 6 ft. and 8 ft. Engine Lathes, Bullard.
 1 20 in. x 8 ft. Pattern Lathe and Floor Stand.
 1 20 in. x 6 ft. Bullard Turret Lathe (c), Power Feed.
 4 Brainerd No. 7 Millers, 2 with arm.
 1 Brainerd Heavy No. 6 Lincoln Pattern Miller.
 1 Brainerd No. 15 Universal Miller.
 2 Brainerd No. 5 Universal Millers.
 1 B. & S. No. 1 Universal, complete.
 3 Garvin Millers, Nos. 2, 3, and 4.
 1 Blaisdell 30 in. Single Spindle Drill.
 1 Garvin 1 Spindle Profiling Machine.
 3 Sensitive Drills, Slat, 1, 2 and 3 spindle.
 1 20 in. 38 in. Wood & Light Gap Drill.
 2 P. & W. Drills, 1 and 2 spindle.
 6 Bench Drills, capacity 5-16 in.
 2 Suspension Drills, Pond, heavy.
 2 Punch Presses, 1 Wilder and 1 Stiles.
 2 Garvin No. 2 Wire Feed and Plain Screw Machines.
 1 Garvin Small Gear Cutter.
 1 Bullard 15 in. Stroke Shaper.
 1 6 in. B. & P. Shaper, Hand and Power.
 2 Bolt Cutters, 1 1/2 capacity.
 6 Speed Lathes, Garvin and Young.
 1 No. 4 Diamond Grinder.
 1 Forge.
 1 27 x 27 x 6 ft. English Screw Planer.
 1 8 ft. Vertical Boring Mill, 2 heads and pulley attach.
 1 30 x 30 x 8 ft. Niles Planer.
 1 Bement Axle Lathe, Single.
 1 36 in. x 18 Engine Lathe.

ALSO LARGE STOCK NEW TOOLS

THE NILES TOOL WORKS CO.,
 Eastern Branch, 136, 138 Liberty St., N. Y. City.

New York Agents PRATT & WHITNEY Co.

FOR SALE. CHEAP.

400 tons of 60 lb. rails, 200 tons of 52 lb. steel rails, 400 tons of 35 lb. second-hand iron rails with fastenings, one 4 horse-power engine and 8 horse-power boiler. Also other engines and locomotives, second-hand. Sawed and cut rails a specialty.

J. H. RICHARDSON & CO.,
 Pittsburgh, Pa.

WANTED.

Practical Boiler Maker with small capital and business, to take interest in small shop. Fair business established and a good opportunity to an energetic man of ability. Applicants must be well recommended as to mechanical ability and moral character, and other things equal American preferred. Address

"W. B. & S.,
 office of *The Iron Age*, 96-102 Reade St., New York.

WANTED.

A Corliss Engine, either 20 x 42, or 18 x 48, or 12 x 42. Address

ROOM 39,
 Standard Block, Cleveland, O.

DON'T INVEST in expensive tools or machinery or let a contract before getting our estimate for making novelties or parts. Fine, difficult and accurate parts a specialty. White metal work at prices that cannot be duplicated. Inventions perfected. Models made. Secrecy and satisfaction guaranteed, and no extra charge for new ideas or improvements. To insure reply to letters of inquiry only, enclose stamp. THE H. H. FRANKLIN MFG. CO., Syracuse, N. Y.

FOR SALE.

One 14 x 24 Trenton Automatic Cut-off Engine, nearly new, 125 H.-P.

KEYSTONE ENGINE & MACHINE WKS.,
 5th and Buttonwood Sts.,
 Philadelphia.

Wanted, Contracts

For building mining, blast furnace, rolling mill and factory machinery, for making castings for cable and electric railroads, or any special line of castings. Address

MAHONING FOUNDRY AND MACHINE SHOP

Danville, Pennsylvania.

WANTED.**TO BUY FOR CASH.**

First-class second-hand Engine Lathes, Planers, Drill Presses, Milling Machines, Bolt Cutters, and other machine tools. Address

THE LODGE & DAVIS MACH. TOOL CO.,
 Cincinnati, O., U. S. A.

WIRE NAIL MACHINES WANTED.

Parties having German Press machines equal to Malmédie's C. A., or smallest size Blow machines, in good running order, for sale, will hear of a cash buyer by applying with terms to "M. W. N. M." No. 118, office of *The Iron Age*, 96-102 Reade St., N. Y.

SCRAP IRON FOR SALE.

We offer the following material for prompt delivery and at very reasonable prices.

500 tons Structural Steel Scrap, in good shape.
 200 tons No. 1 R. R. Wrot. Scrap.
 500 tons Machinery and Railroad Cast Scrap.
 300 tons Mixed Steel.
 300 tons Grate Bars and Retorts.
 200 tons Clean Stove Plate.
 100 tons Light Sheet Iron.
 100 tons Bundling Wire.

Correspondence Solicited.

SWARTS IRON & METAL CO.,

Chicago's Leading Scrap Iron House.
 551 to 557 So. State St.,
 CHICAGO, ILL

WANTED.

One 16 or 18 x 42 Corliss Engine.
 OVERBECK BROS. MFG. CO.,
 Centralia, Wis.

WANTED.

Old Boilers, Cast Scrap, Wrought and Steel Scrap, worn out machinery. Works at Darby, Pa. Address

JOHN W. SWANGER,
 Cum Lynne, Del. Co., Pa.

WELD STEEL MAKERS.

Owner of Tube making processes seeks financial aid to complete plant and manufacture for the market. Would make a profitable department for a mill turning out Sheet and Plate. Address

"ECONOMY,"

Post Office Box 1086, New York City.

FOR SALE.

A Weimer Blowing Engine 36 in. steam and 72 in. Air Cylinders, 4 ft. stroke. In good condition. Address "C. I. C." office of *The Iron Age*, 96-102 Reade Street, New York.

AGENCY WANTED.

Advertisers having an established trade with railroads, locomotive builders, machine shops, &c., desire to add a first-class agency; have ample warehouse room. Address

"A. & W.," Box 111,
 office of *The Iron Age*, 96-102 Reade St., N. Y.

WANTED.

To manufacture specialties and novelties of Wire or Wire Rods. Address
 "WIRE," Box No. 236,
 New Castle, Pa.

RECEIVER'S SALE

—OF THE—

BRANFORD LOCK WORKS,
 Branford, Conn.

DECEMBER 23, 1893.

By order of the Superior Court of Connecticut the property and business of the Branford Lock Works is hereby offered for sale as a going concern, which can be transferred to the purchaser entire and with the business in operation.

The business has been in existence upward of thirty years and its products are widely and favorably known to the hardware trade throughout the United States. They include a very complete line of builders' hardware of good quality, to which has recently been added a number of excellent goods of the better grade. A new and handsome illustrated catalogue of the company's products has just been issued and distributed to customers. During recent years the volume of annual business has exceeded \$300,000.

The plant is located in the town of Branford, on the Shore Line R.R., seven miles east of New Haven. It comprises several acres of ground near the center of the town, and a half interest in a wharf property on the harbor. The buildings are largely of brick, and although not new are well adapted to the business, especially the large iron and brass foundries. The plant has ample capacity for an output, at present values, of at least \$400,000 per annum.

The appraisers' report filed December 8, 1893, places the following valuation on the property, viz.: Real estate, \$31,180; merchandise, as per inventory, \$43,206.15; machinery, \$17,308.50; special tools, \$5,861.56; general shop fixtures, \$19,972.15; patterns, \$8,000; horses and wagons, \$600; electrotypes, \$500; cash, bills and accounts receivable, \$33,245.73—total, \$159,964.12.

In addition to these tangible assets is the good will of the business, which has been established upward of thirty years, and the amount of which, as above stated, averages more than \$300,000 per annum. At present the business is being conducted by the receiver as usual and without interruption, so that it may be transferred to a purchaser as a going concern and without the impairment of value which might result from a temporary stoppage.

Parties desirous of investigating the property are requested to communicate at once with the receiver, who will furnish full information concerning it and will arrange for those who so desire to visit and inspect the property.

The receiver will be pleased to submit to the Court any offer which may be made for the plant and business. Respectfully,

HENRY R. TOWNE, Receiver.

Address all communications to
 HENRY R. TOWNE, Receiver,
 No. 121 Madison avenue, New York.

ASSIGNEE SALE

—OF A—

VALUABLE PLANT.

The undersigned assignee of G. Ehrhardt & Sons, Pittsburgh, Pa., has been authorized to sell at private sale the valuable machine shop of above firm, located on line of the P. R. R., near Homewood Station, about six miles from Pittsburgh, Pa.

The plant is about three years old, and is fully equipped for the manufacture of cold saws and cold sawing machines. It has a frontage of over 300 feet on P. R. R., with a depth of 100 feet and a new side track, affording excellent shipping facilities. The main building, brick and frame, with stone foundation, is about 90 x 60 feet, and a large frame storage house stands about 50 feet from main building.

This affords a rare opportunity for anyone desirous of engaging in a very profitable business with a moderate investment. The plant can be bought as a whole, or the ground with buildings and side track can be bought separately from the machinery in use and new stock. Offers for the purchase of the plant should be made before February 5, 1894. For full particulars apply to

JUSTI S. MULERT, Assignee,
 Germania Bank Bldg., 421 Wood St., Pittsburgh, Pa.

AN OLD ESTABLISHED hardware house in New York, whose salesmen cover the entire United States, wants the sole agency of American manufacturers of Chains, Toilet Clippers, Locks, Files, Carpenters' Tools and similar articles. Address

"W. B. G.," No. 105,

office of *The Iron Age*, 96-102 Reade St., New York.

SCISSORS.

A large firm at Solingen (Germany), which for the last ten years has indirectly exported to England and North America, wishes to get directly connected with buyers of forged scissors. Address offers to "E. 8405," care Rudolf Mosse, Cologne a/R.

100 CITIES AND TOWNS WANTING INDUSTRIES

Is the title of a pamphlet issued by the Illinois Central R. Co. If you are thinking of making a change in location and are not well informed as to the advantages of locating either in the West or South, write for a copy. If you want in a nutshell the

SALIENT POINTS OF OVER 100 PLACES

on the line of the Illinois Central and Yazoo & Mississippi Valley Railroads, giving the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries desired, etc., apply to the undersigned. Our line is in the shape of the figure "7" and runs from Sioux Falls, S. D., and Sioux City, Ia., to New Orleans, passing through South Dakota, Iowa, Minnesota, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and has

NEARLY EVERY KIND OF RAW MATERIAL

used in manufacturing, together with populous sections which are large consumers of the manufactured product. To sound industries which will bear investigation, substantial inducements will be given by many of our places, and they will be welcomed heartily by the different sections traversed by the Illinois Central and Yazoo & Mississippi Valley Railroads. For all information on the subject, address

GEO. C. POWER,
Industrial Commissioner I. C. R. R., Central Station, Chicago, Ill.

A YOUNG MAN, 30,

in established and well paying importing Cutlery business desires to put himself in communication with a gentleman of unquestioned character and business ability, with not less than \$25,000 capital, with a view of partnership and to increase present business. Address

"IMPORTING CUTLERY,"

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FOR SALE.—One-half interest in one of the oldest and best known manufacturing establishments in the country, with a large and profitable trade in nearly every State in the Union with over 1000 customers. Business established fifty years and for past six years has paid 50% annually on capital invested. Plant the most modern and best equipped of any like plant in the country. Goods handled by all hardware, house furnishing goods dealers and department stores. Object in selling is to obtain additional capital to add new lines of goods and to open up trade in foreign countries where there is a good field open. Capital required \$35,000. Address "FOREST," office of *The Iron Age* 96-102 Reade St., New York.

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Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.

BY A TRAVELING SALESMAN having extensive acquaintance with jobbers of hardware and with carriage manufacturers in 23 States; thoroughly familiar with all kinds of carriage material, and some line of such goods preferred, but would handle another line; reference, past employers. Address "CARRIAGE HARDWARE," office of *The Iron Age*, 96-102 Reade St., New York.

BY EXPERIENCED heating and mechanical engineer and salesman, thoroughly versed in steam and hot water heating and power work; competent to estimate on cost, lay out work, take charge of men, and superintend the erection of work; correspondence solicited with manufacturers of heating and power apparatus. "HEATING ENGINEER," office of *The Iron Age*, 96-102 Reade St., New York.

SALABLE article, as side line, wanted by party visiting hardware and machinist trade and factories. "J. H. B.," P. O. Box 3072, New York.

A FIRST-CLASS ROLLER of twenty years' experience in guide, merchant and hoop iron and steel, wishes employment; can furnish references if desired. Address "GUIDE ROLLER," office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa.

OPEN HEARTH SMELTER, has had years of experience, will be open for engagement after January 15, 1894. Address "SMELTER," office of *The Iron Age*, 96-102 Reade St., New York.

A MANUFACTURERS' Traveling Salesman with many years' experience and well acquainted in New England and Central New York would like to add another line to the one he already has, to cut the expenses down; prefer something in hardware or shoe finders' goods; all parties are reliable. Address "SHOE FINDERS," office of *The Iron Age*, 96-102 Reade St., New York.

YOUNG MAN (31), good business qualifications and well recommended, desires engagement as salesman, purchasing agent or shipper; has an extensive knowledge of iron supplies for manufacturing purposes, steam, water, etc.; good figurer and estimator; has capacity to work up trade as Chicago agent. "MACLEAN," office of *The Iron Age*, 59 Dearborn St., Chicago.

AN EXPERIENCED SALESMAN with extensive acquaintance among the larger buyers of builders' hardware throughout the East, having office in N. Y. City as agent for a first-class manufacturer, is anxious to represent an additional company. Address "H. K. W.," No. 111, office of *The Iron Age*, 96-102 Reade St., New York.

TOOL AND DIE MAKER who has been employed for long time as first tool maker in factories making large quantities of electric articles in Germany and New York; well up in the construction of mechanical work; willing to go to any locality. Address "E. G.," office of *The Iron Age*, 96-102 Reade St., New York.

BY A SWEDISH CIVIL ENGINEER of large experience, especially in water works, canals, drainage, sewerage and such; able to measure and calculate water power; also familiar with power transmissions, shop work and structure work; age 44; salary of secondary consideration; references. "SWEDEN," office of *The Iron Age*, 96-102 Reade St., New York.

SELLING AGENCY WANTED, for blast furnace and iron and steel works products, by a gentleman having extensive acquaintance among railroads, foundries and shops. Address "AGENT," No. 111, office of *The Iron Age*, 96-102 Reade St., New York.

AN EXPERIENCED SALESMAN and Agent with thorough knowledge of iron and machine trade, having office in Cookery, Chicago, would like to represent one more reliable concern. Address "HUSTLER," office of *The Iron Age*, 59 Dearborn St., Chicago.

A MEMBER OF AMERICAN SOCIETY of Mechanical Engineers, who has had 20 years' practical experience as follows: machinist, head draughtsman, erector of steam plants, engineering, estimating, contracting and office work and superintendent of large engine works, is available for responsible position. Address "ENGINE WORKS," No. 10, office of *The Iron Age*, 96-102 Reade St., New York.

MANUFACTURERS of leading goods who desire first class representation to the wholesale and jobbing trade of the West and Northwest are respectfully invited to correspond with "SELLING AGENT," office of *The Iron Age*, 96-102 Reade St., New York.

A FALSE CORE MOLDER who was in charge of a brass foundry for a long time in Germany and over three years in New York City, is looking for a steady position. "G. R.," office of *The Iron Age*, 96-102 Reade St., New York.

BY CHEMIST experienced in iron and steel analysis and accustomed to general work outside laboratory, conducting tests, etc.; highest references. Address "EXPERT," Box 1228, office of *The Iron Age*, 96-102 Reade St., New York.

BY A TRAVELER thoroughly acquainted, in anything in the hardware or metal line to sell in the principal cities through the West on salary or commission. Address "N.," No. 1228, office of *The Iron Age*, 96-102 Reade St., New York City.

BY A FIRST-CLASS BUSINESS MAN, with 15 years' practical experience as a rolling mill manager; thoroughly competent, and of the highest character; will be open for an engagement about February 1; is now engaged with large concern, but for satisfactory reasons desires to change. Address "GENERAL MANAGER," office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa.

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SALESMEN.—If you have ability and perseverance you can make good income, upon a most liberal commission basis, selling English's Workman's Time Recorder; write for circulars and terms, and send references. COLUMBIAN TIME RECORDER CO., 32 Frankfort St., N. Y.

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FOREMAN or working superintendent; a specialty manufacturing concern, employing about 100 hands, could make use of a good practical mechanic, if competent to direct and manage help and not afraid of work. Salary moderate. Give full particulars. Address "WORKING SUPERINTENDENT," office of *The Iron Age*, 96-102 Reade Street, New York.

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SALESMEN visiting hardware trade to carry patented article in constant use as a side line; liberal commission; big seller. Address "GALLT," 85 Franklin St., New York.

SALESMEN in Arkansas, Miss., Ala., Georgia, S. Carolina and Florida to sell staple line of hardware on commission. Address "EDWARDS," care E. S. ADAMS, office of *The Iron Age*, 312 The Cuyahoga, Cleveland, O.

SALESMEN visiting hardware trade to sell as a side line on commission our Unique Self Heating Hair Curler; it sells equally as well to the following dealers: Druggists, Jewelers, Barbers, Dry Goods, News Stands, etc. Address, with references. UNIQUE NOVELTY CO., 99 to 103 Abbot St., Detroit, Mich.

SALESMEN to sell on commission to the hardware, plumbing and rubber trade the best and cheapest line of lawn sprinklers made; see advertisement in this paper. Address ETTE & HENGER MANUFACTURING CO., St. Louis, Mo.

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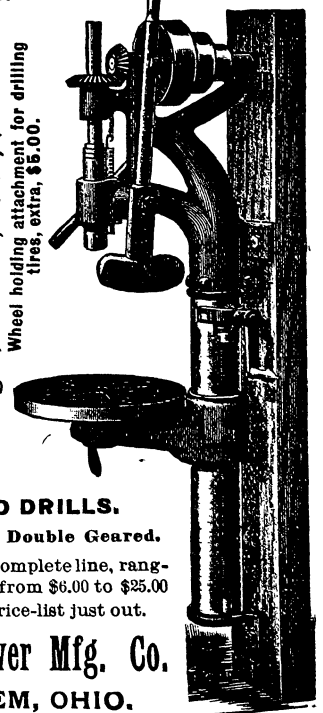
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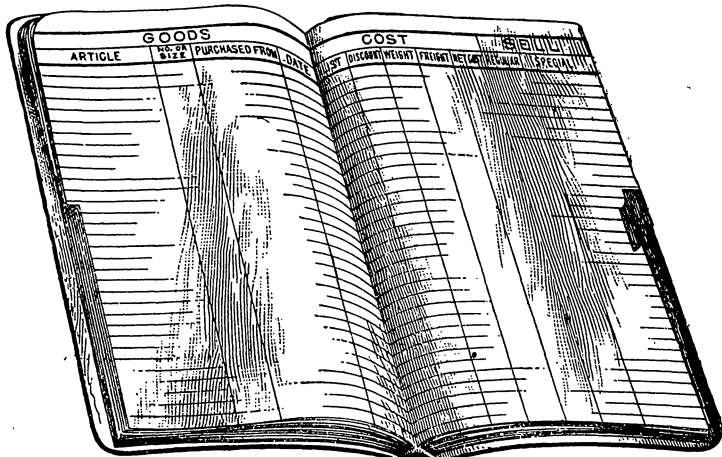
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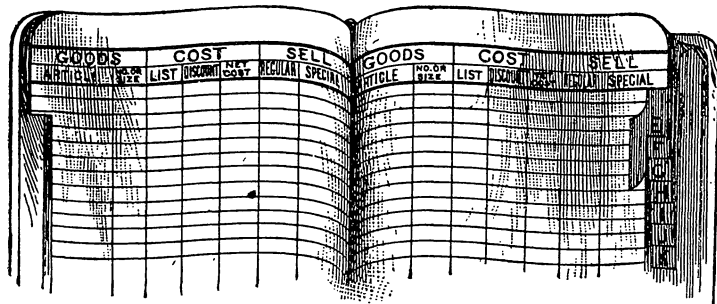
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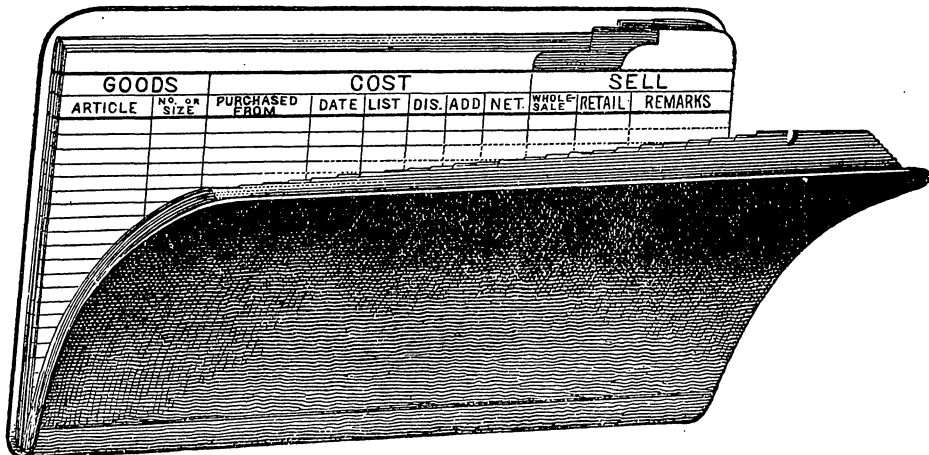
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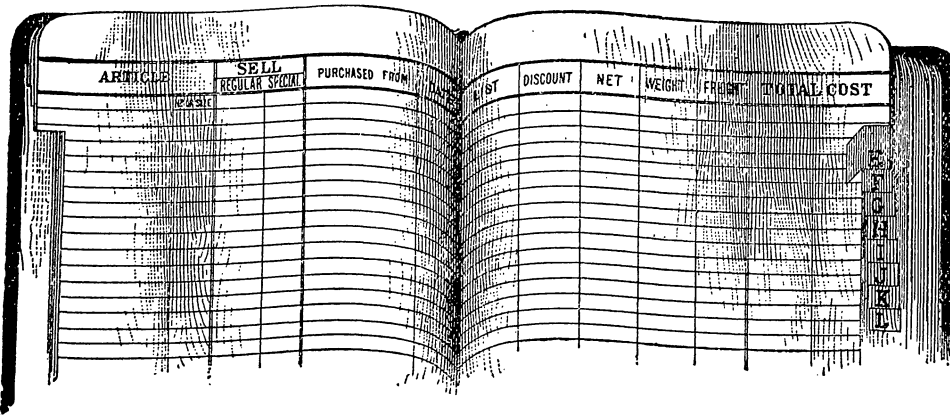
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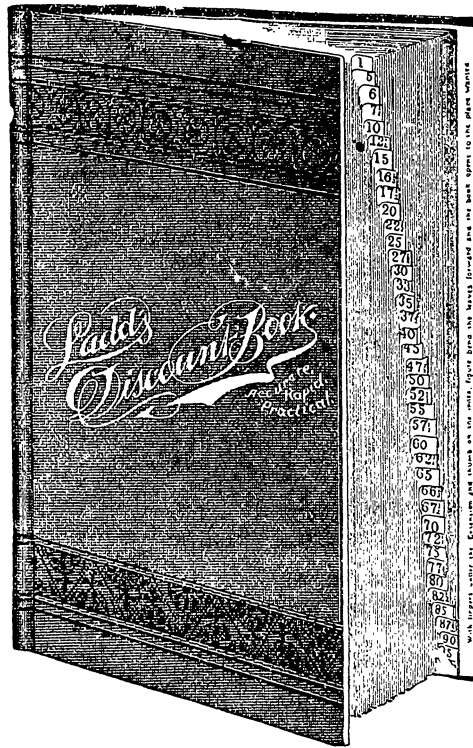
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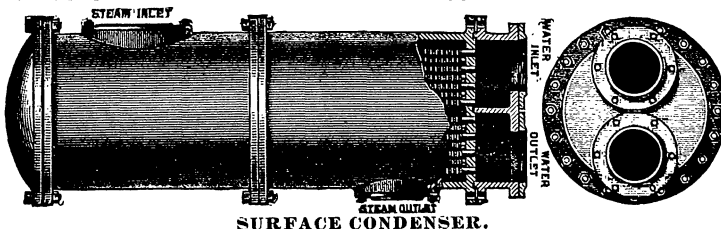
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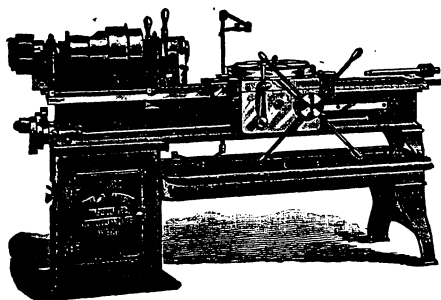
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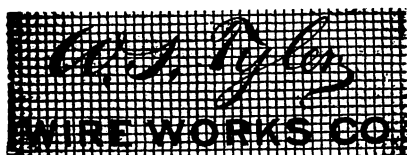
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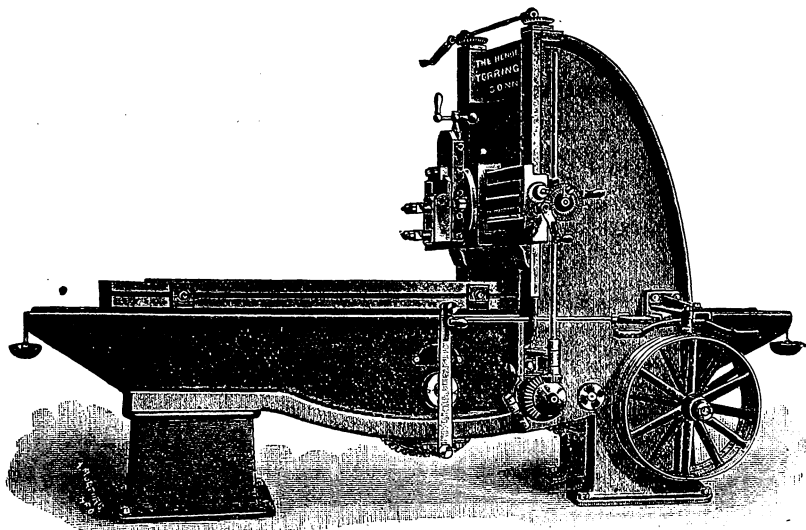
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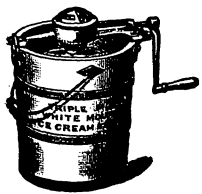
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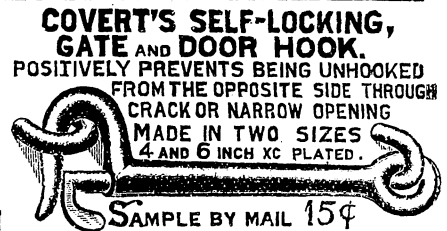


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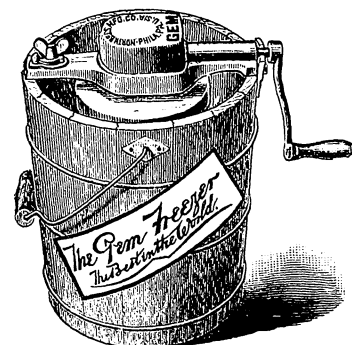
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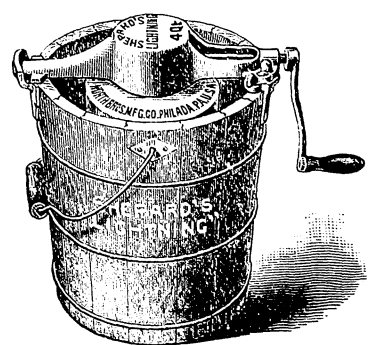
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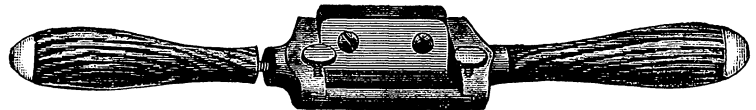
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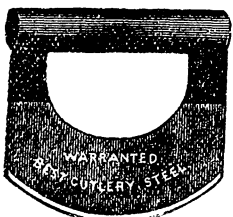
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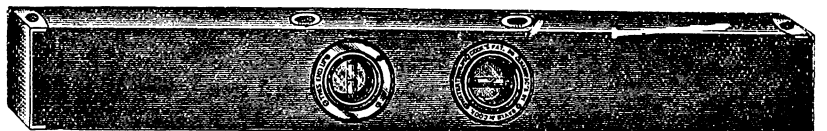
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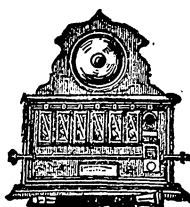
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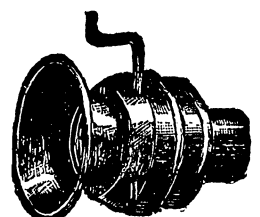
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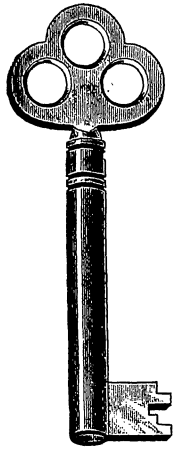
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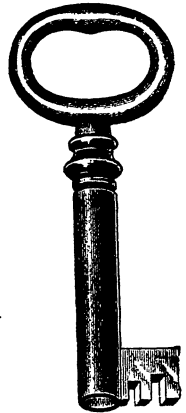
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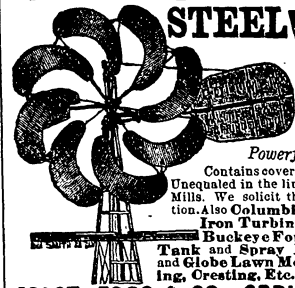
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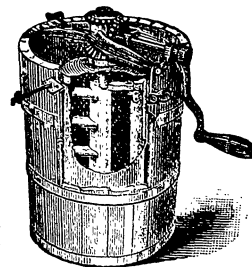


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Fig. 209.

Fig. 381.

Fig. 145.

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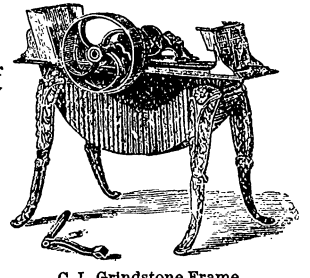
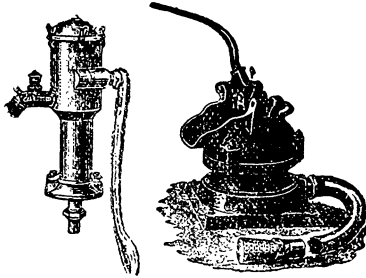
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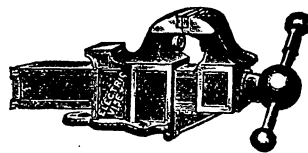
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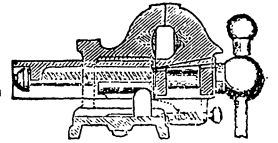
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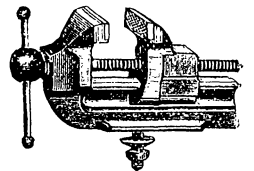
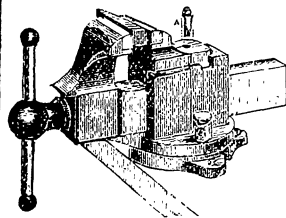
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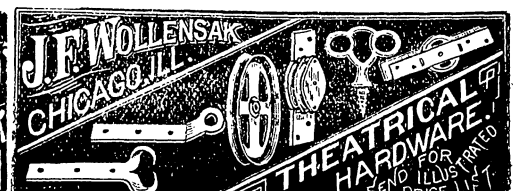
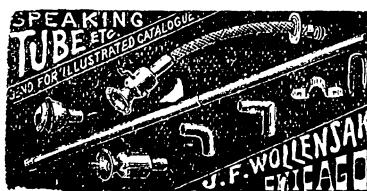


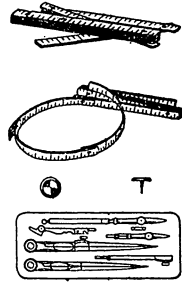
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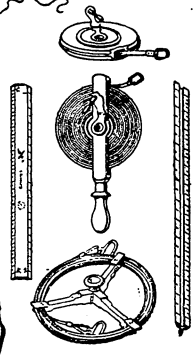




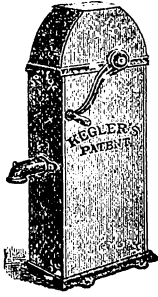
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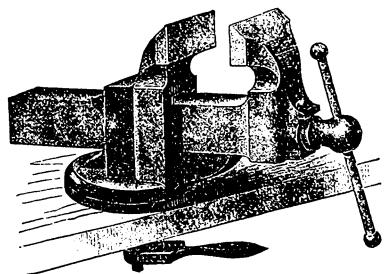


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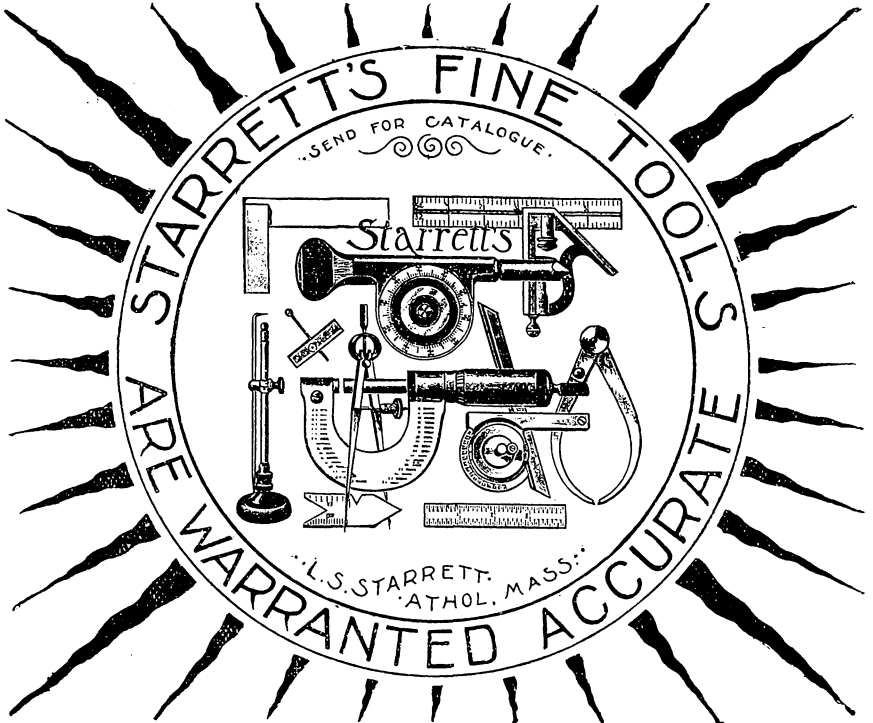
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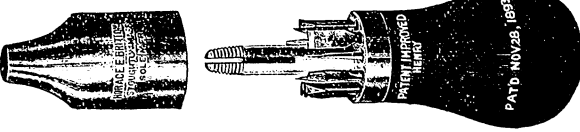
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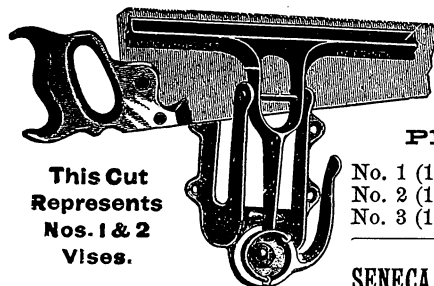
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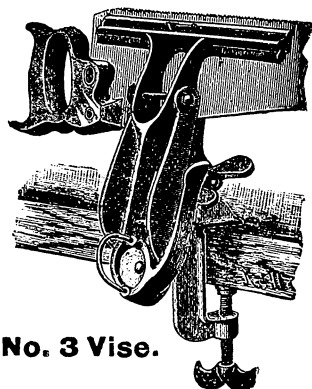
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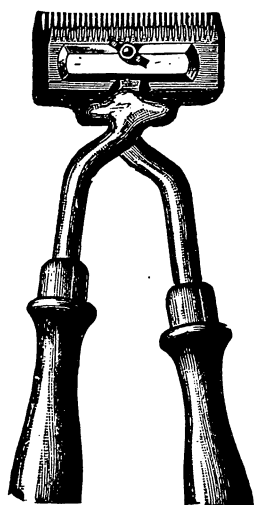
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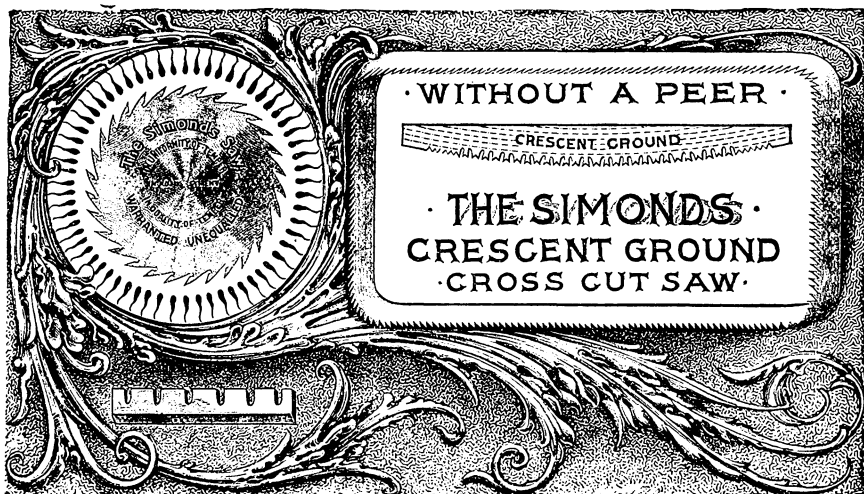
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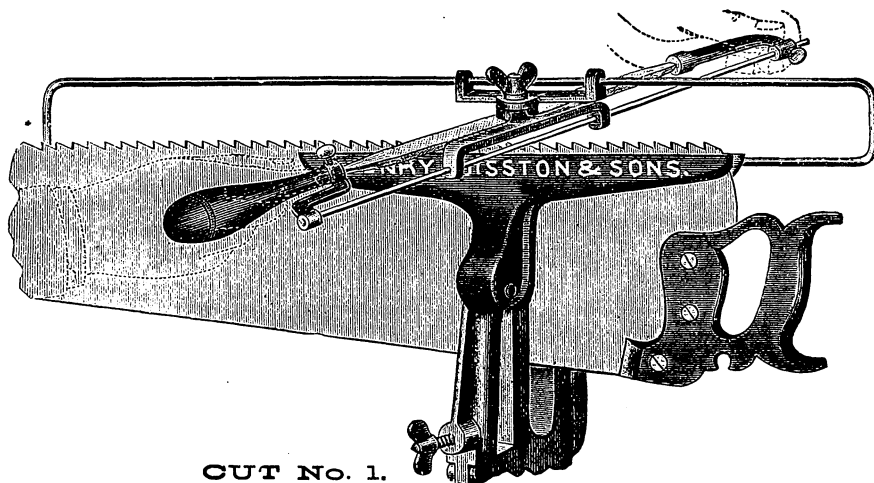
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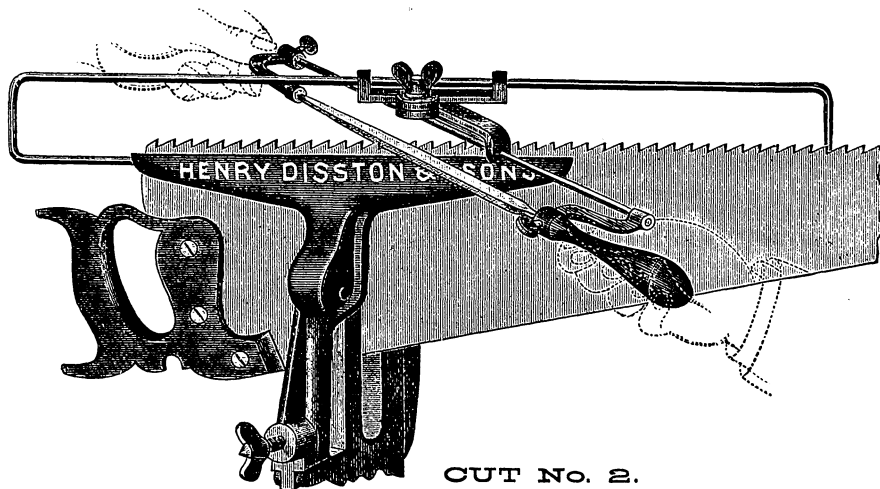
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ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART
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CUT No. 1.

Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT No. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

Write for price including No. 3 Clamp, Filing Guide, File and Handle complete. Packed one in a wooden box.

Henry Disston & Sons, Philadelphia, Penn. INCORPORATED,

Samuel W. Allerton, Pres.

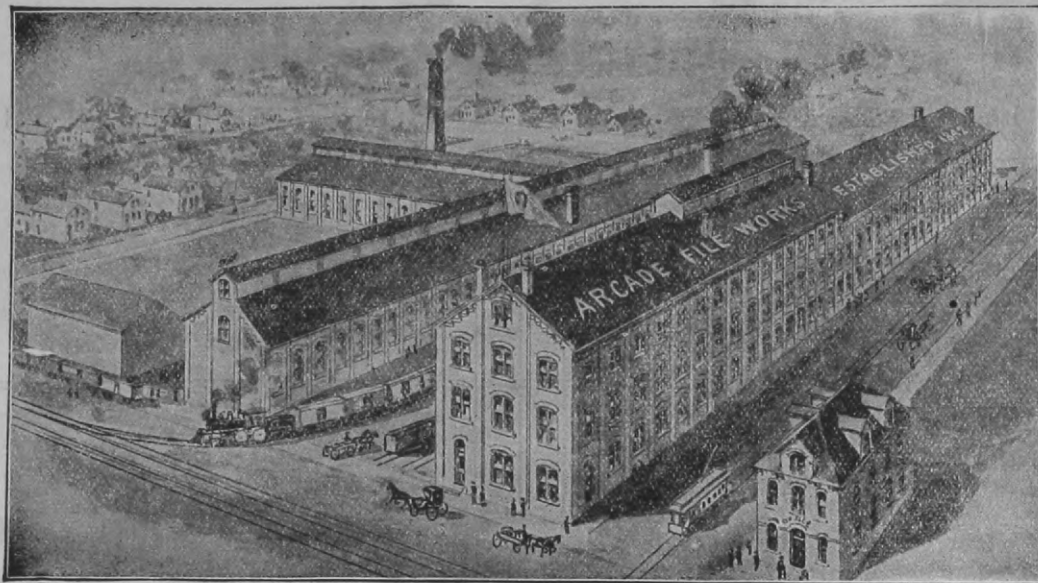
Courtlandt C. Clarke, Sec. and Treas.

Alfred Weed, Vice-Pres. & Gen. Manager.

ARCADE FILE WORKS.

ESTABLISHED 1842.

Eastern Office and Warehouse,
83 READE STREET, NEW YORK CITY.



Western Office and Warehouse,
23 LAKE STREET, - CHICAGO, ILL.

Works: ANDERSON, IND.

THE FILES THAT LEAD THEM ALL.

THE BEST EQUIPPED FILE WORKS IN THE WORLD.

The fact that we alone use the improved File Machinery recently invented by Alfred Weed, and the even heat of natural gas, enables us to produce a file that will cut faster and wear longer than any on the market.

Warranted Better than the Best ENGLISH ANVIL

Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, of hardest temper, and never to come off or "settle." Horn of tough untempered steel, never to break or bend. Only Anvil made in the United States fully warranted as above.

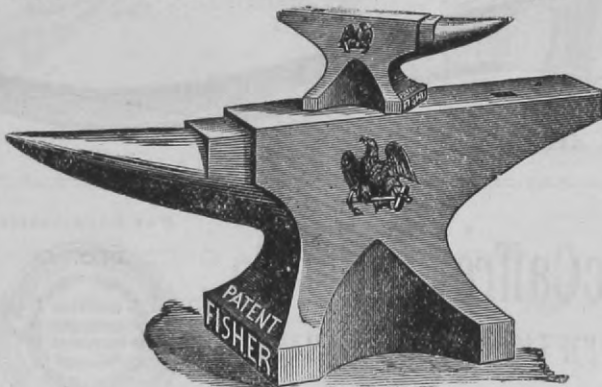
FISHER DOUBLE-SCREW VISE

IS FULLY WARRANTED STRONGER THAN ANY OTHER LEG VISE, AND ALWAYS PARALLEL. Is the best Vise for Machine Shops and Blacksmiths, and for all heavy work. ACCURATE AND DURABLE. Send for Circular.

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MORE THAN 200 DIFFERENT PATTERNS.

None Genuine without our Trade-Mark.

EAGLE and "FISHER" Stamp.



EAGLE ANVIL WORKS,

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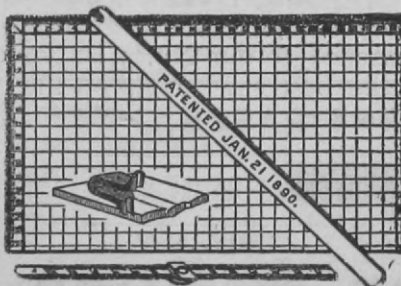
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Machine Knives, Shear Blades,
Presses and Dies.

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Cuts any Fraction of an Inch by Eighths.

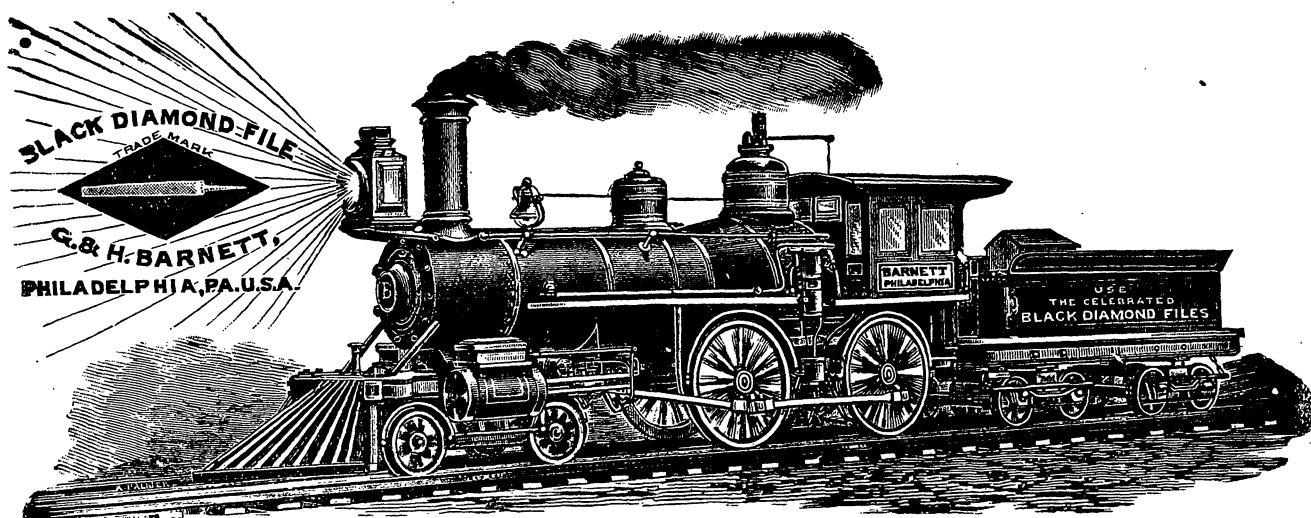
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IMPROVED TRAMMEL RULE for Cutting Circles
From 3 inches up to 48 inches, Segments,
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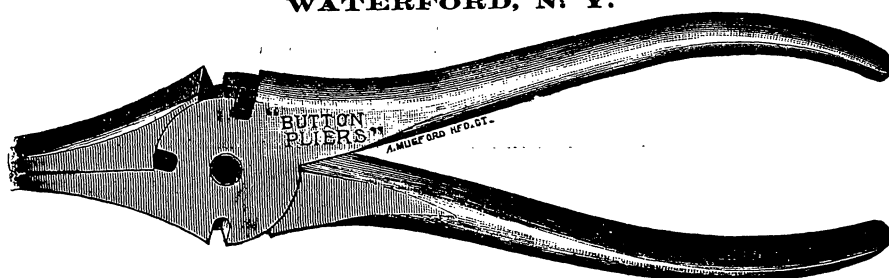
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3000 VARIETIES FILES [X.F.] AND INCREMENT CUT FILES

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Specially Adapted for Use on Wire Fence.

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Manufacture and keep in stock a full line of FILES and RASPS only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

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BEST
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"TROJAN" HORSE RASPS.

LOWEST
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STRONGEST
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Engraver and Die Sinker,
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Manufacturer of
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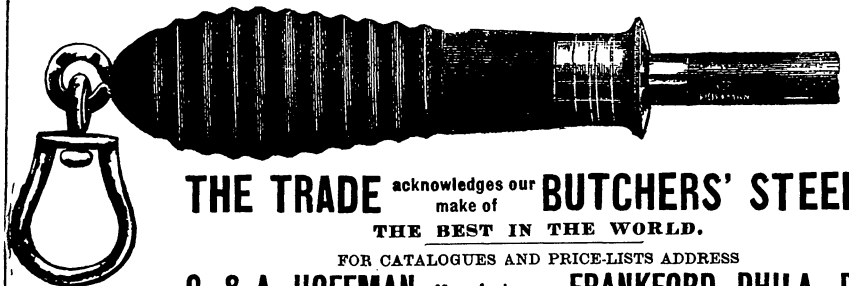


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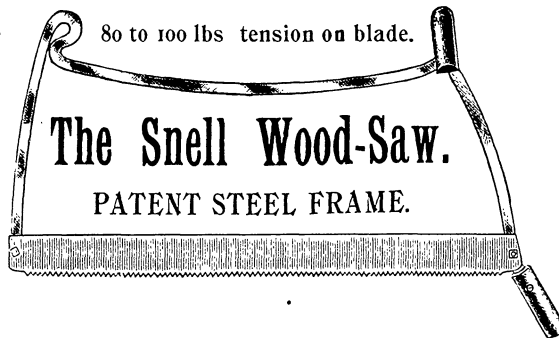
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PATENT STEEL FRAME.

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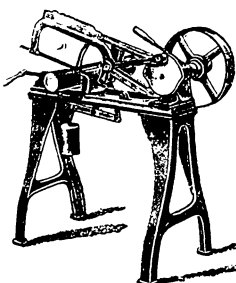
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Pressure is entire-
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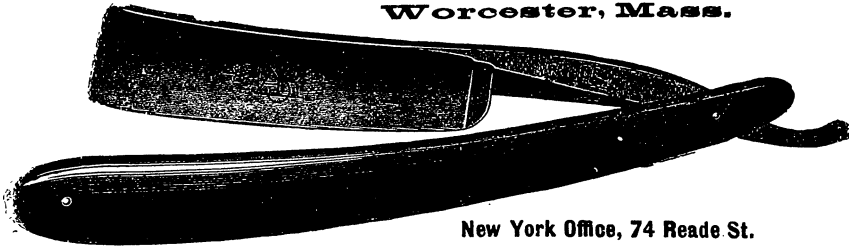
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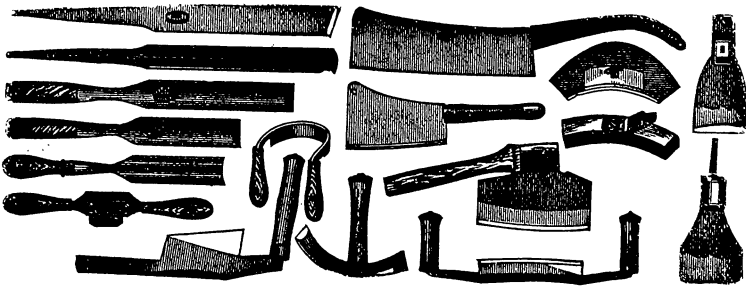


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Coopers', Carpenters' and Ship Tools, Plane Irons,
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The New M. and P. Bit Brace.

Strictly High Grade. 5 Sizes.

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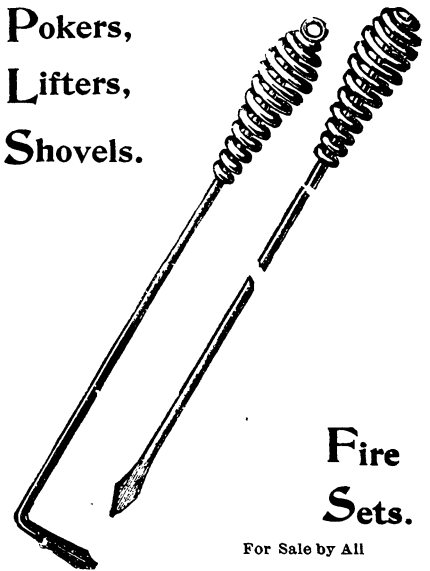
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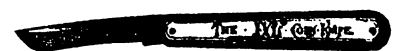
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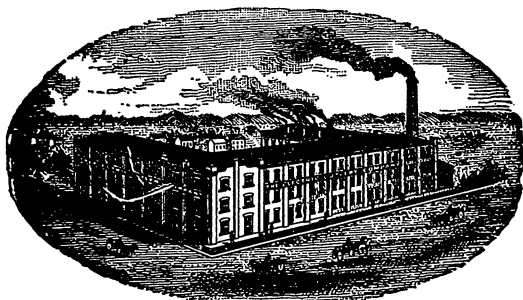
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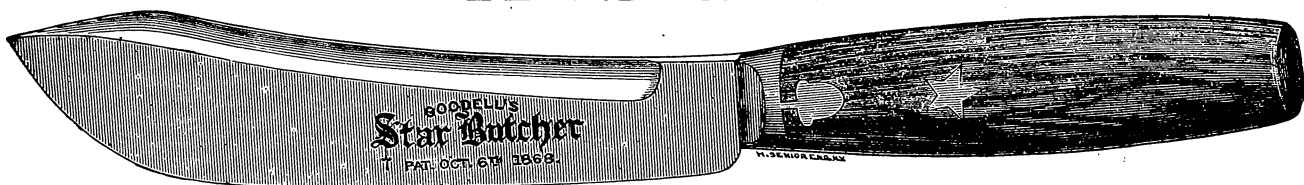
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WE DON'T KNOW HOW TO IMPROVE IT.

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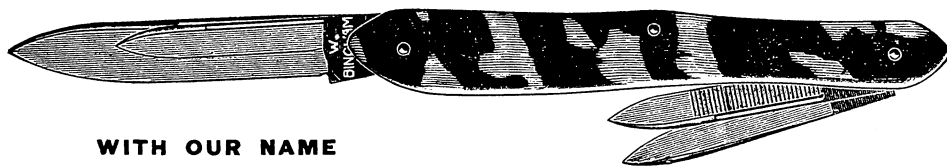
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Scissor,
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and 50 years'
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It cuts deep, the "Anchor Brand" of Hatchet, also the reduced prices on my new discount sheet. If you have not yet received one do not hesitate to write. It will interest you.

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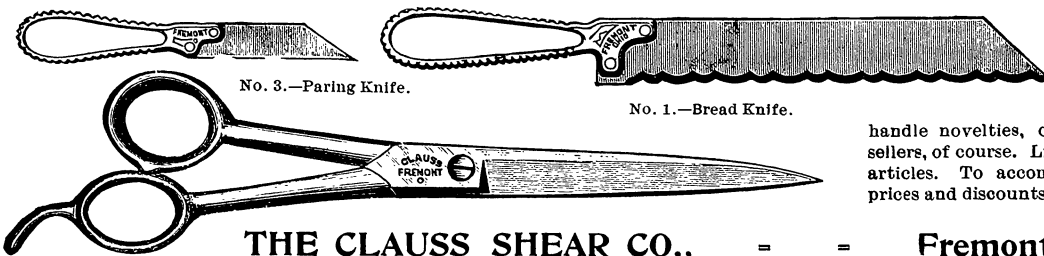


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Special Cob Breaking Device and peculiar dress
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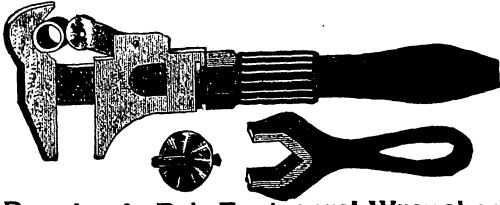
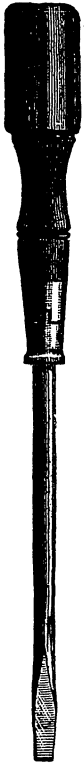
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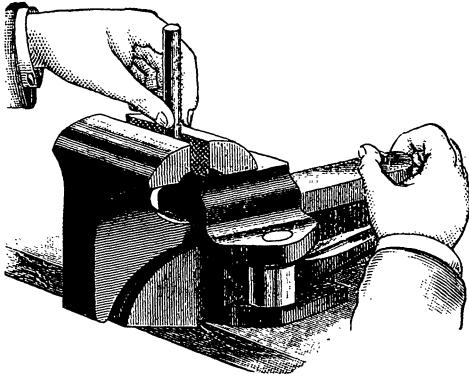
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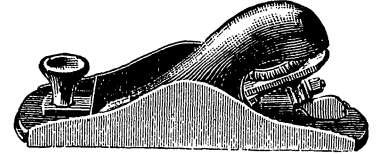
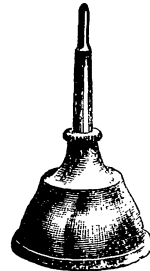
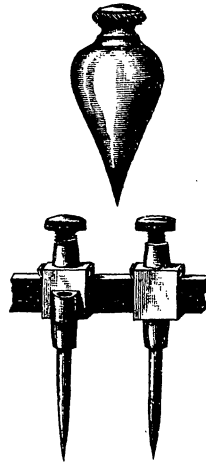
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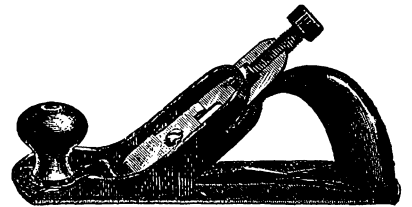
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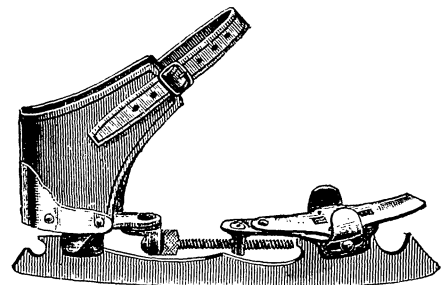
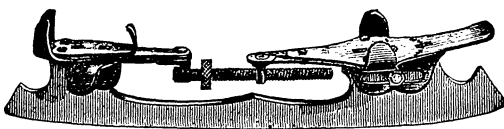
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ICE SKATES

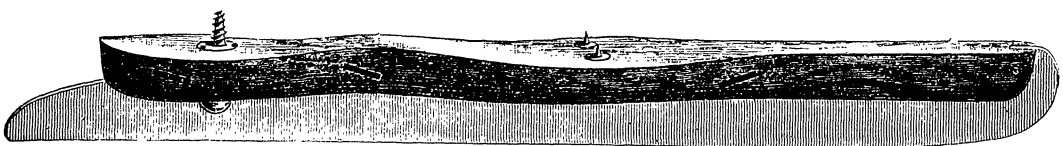
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DONOGHUE RACING SKATE.



SUPERIOR QUALITY, STYLE AND FINISH.

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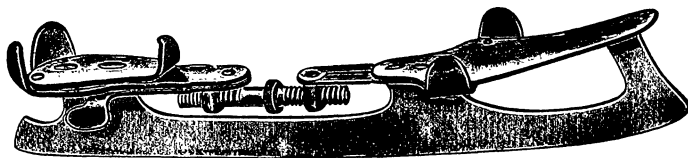
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Double Action in 32, 38 & 44 Cal.

H. & R. Imp. Ejecting Double Action,

H. & R. Imp. Automatic Double Action,
In 32 and 38 Caliber.

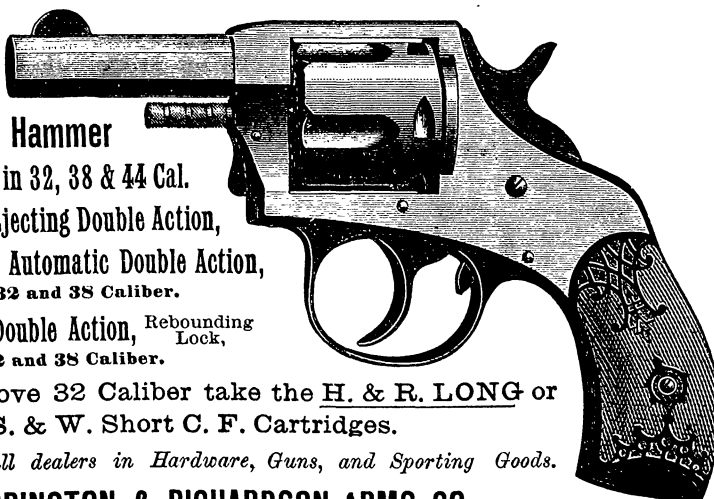
And Premier Double Action, Rebounding
Lock,
In 32 and 38 Caliber.

All the above 32 Caliber take the H. & R. LONG or
S. & W. Short C. F. Cartridges.

For Sale by all dealers in Hardware, Guns, and Sporting Goods.

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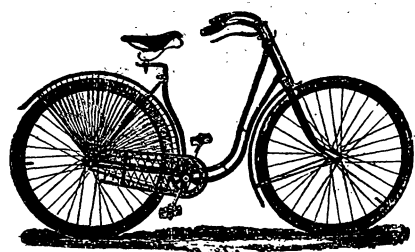
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FOR DOORS AND WINDOWS, ARE WELL
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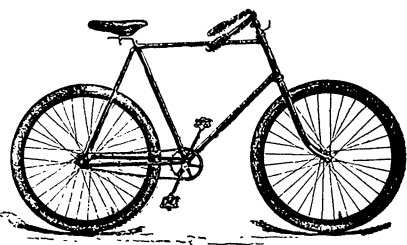
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Car Load of Nails

will not afford you the profit that
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Monarch Bicycle

THE BEST IN THE WORLD.

OVER 6000 RIDERS WILL TELL YOU SO.

Awarded Special Medal
for
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by
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Strictly High Grade.
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Finest Material.
Elegant Designs.
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Unsurpassed.

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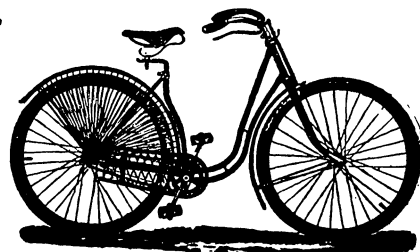
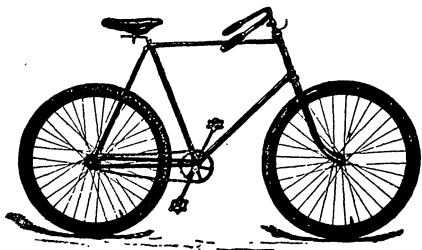
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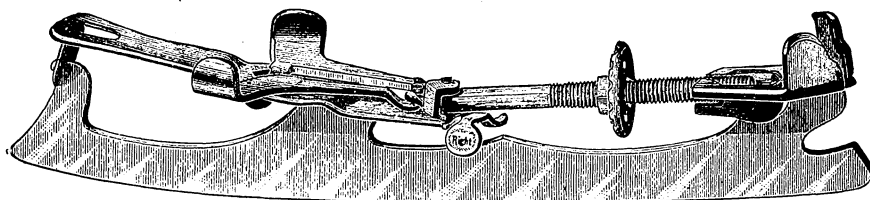
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THE LONG REACH SKATE

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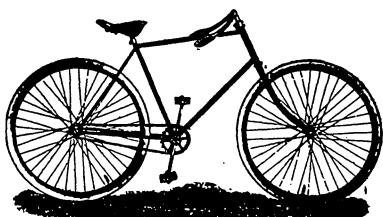


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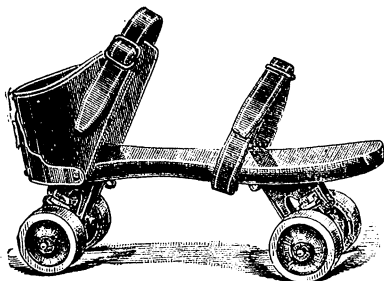
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HENLEY'S -
CELEBRATED

Rink AND Club

Roller Skates.



A full, new and complete stock of Roller Skates, Skate Repairs and Rink Supplies. Address for 80 page Catalogue and Prices,

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YOUR SKATES WILL NOT RUST

IF YOU USE

PARAVASELINE.

It is a Lubricant that will prevent all kinds of metals from rusting.

WHEN YOU COME HOME AFTER SKATING

apply a light coat of Paravaseline to your skates and it will keep them in good condition.

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In Your Business or at the Range?

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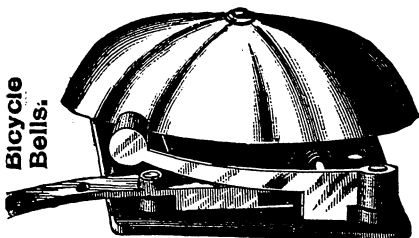
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Especially Low Prices.

We manufacture hardware specialties of all descriptions to order.

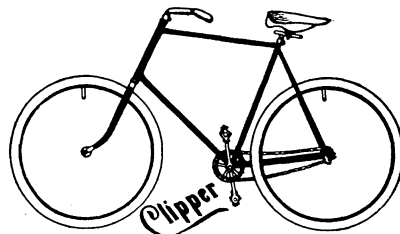
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Manufacturers of

Sleigh Bells, House, Tea Hand Gong Bells, &c.



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are built to please the dealer and rider.

Are you in the bicycle business? If not, you can make it pay to handle Clippers. Buy direct from the manufacturer and save the jobbers' profit. It will add considerable to your bank account. We want responsible dealers only. We may be able to interest you, in fact we are sure of it. Our policy is a protective one, and will please you. It protects against Scalpers and "Curb Stone Brokers."

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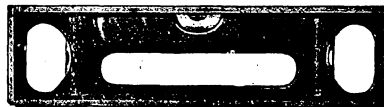
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IRON BENCH LEVEL

WITH DOUBLE PLUMB.

No. 5. 6 in.

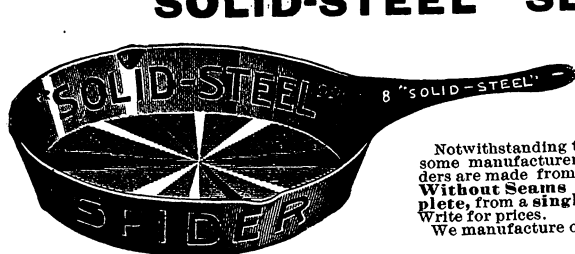


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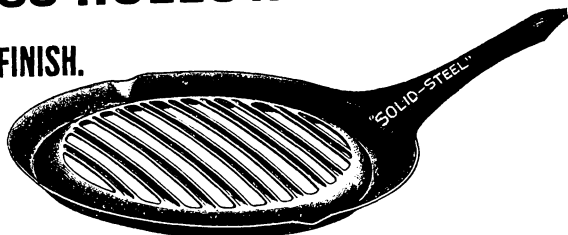
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No Seams, no Rivets in "Solid-Steel" Ware.

BRILLIANT FINISH.

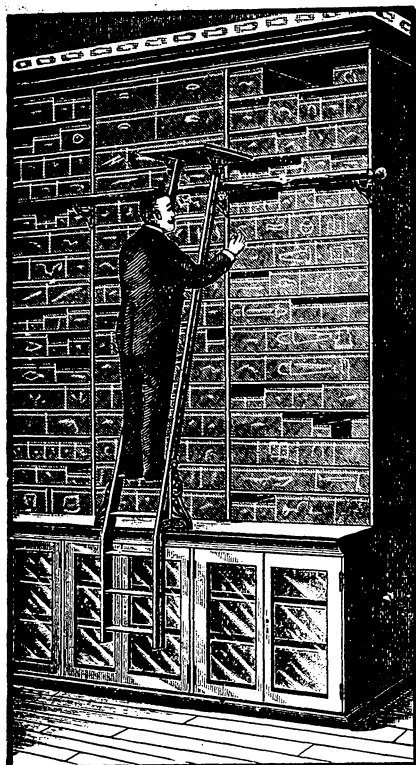


Made without Seams or Rivets.

Notwithstanding the claims made by some manufacturers' agents, our spiders are made from Wrought Steel, Without Seams or Rivets. Complete, from a single piece of metal. Write for prices. We manufacture our own goods.

The Cleveland Stamping & Tool Co., Cleveland, O.

We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.



THE BICYCLE STEP LADDER.

Highest Award, Columbian Exposition. The Newest, Neatest, Simplest, Easiest Operated and Safest Store Ladder made.

Ladders are not Suspended, but Supported from below on wheels. Move easier with operator on than others when empty. Highly finished, and very handsome. Made in different grades and prices to suit.

Send for illustrated catalogue and prices. See this space next week for other styles.

The Bicycle Step Ladder Co., 50 State Street, Chicago, Ills.

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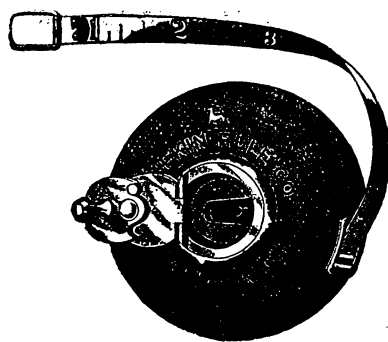
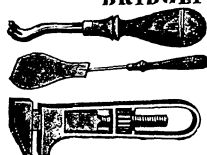
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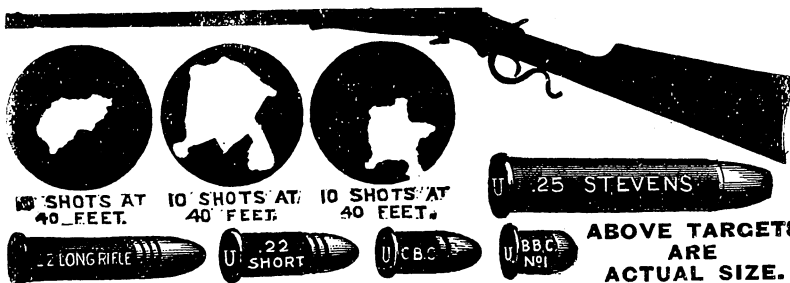
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Made for the 22 or 25 Rim Fire Cartridge.

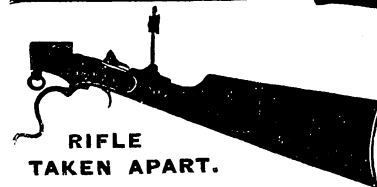
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22-INCH BARREL.

LEVER ACTION LIKE SHARPS. TAKEN APART IN TEN SECONDS.

IT IS SIMPLY IMPOSSIBLE

TO MAKE MORE ACCURATE SHOOTING BARRELS THAN ARE ON THIS RIFLE.



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"MIRROR POLISH," the only Perfect Plain Steel Finish.

"NEVER-BREAK"

WROUGHT STEEL COOKING UTENSILS.

MIRROR POLISHED-TINNED-PORCELAINED.

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BAKING AND ROASTING PANS,
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COOKERS, COFFEE POTS AND
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"IDEAL"

BRASS, BRONZE, NICKEL UM-
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THE BRONSON SUPPLY CO.,
CLEVELAND AND NEW YORK.



No. 3

Globe Street Lamp.

Light your Streets and Driveways.

The S. G. & L. CO.

Tubular Globe Street Lamp

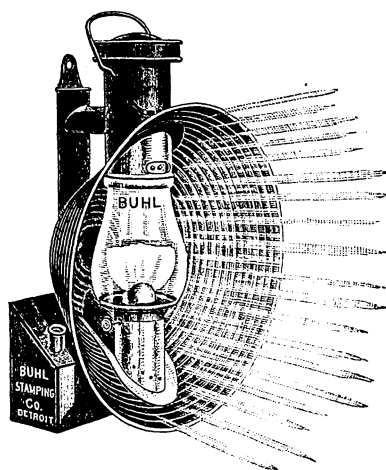
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Equal to the best Gas Light.
Will not Blow Out in the Strongest Wind.
Will not Smoke.
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Automatic Extinguisher.
Outside Wick Regulator.
Will Burn Four Hours for One Cent.

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Buhl Tubular Headlight.

IMPROVED FOR 1893-94.

The most brilliant light at least
expense for Halls, Factories,
Barns, Boat Houses, Traction En-
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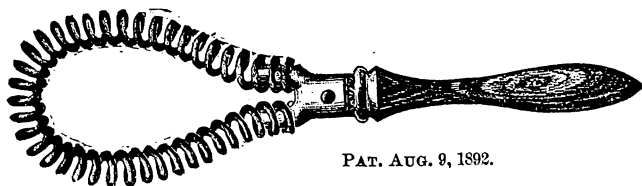
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NEAT, DURABLE, AND DOES THE BUSINESS.

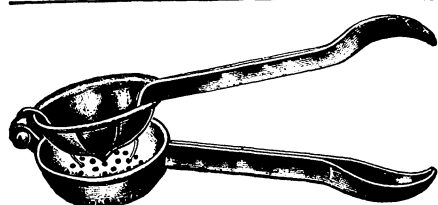
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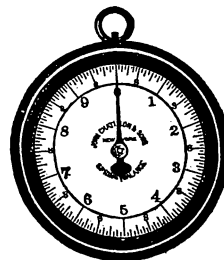
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If so you want our Squeezer. Positively
the best. Suitable for any size Lemon.
Write for samples, catalogue and prices.

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John Chatillon & Sons,

85, 87, 89, 91, 93 CLIFF ST., NEW YORK.



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1835.

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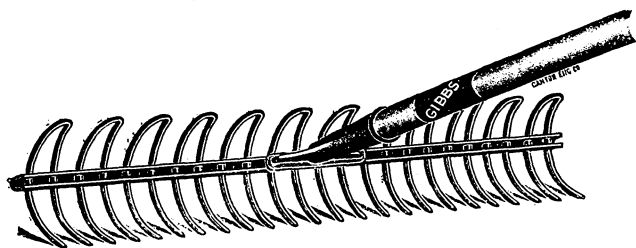
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MOUSE TRAPS
ALWAYS IN STOCK.



THEY DO THE WORK.
Orders solicited. Prices on application.
BURDITT & WILLIAMS,
20 Dock Square, Boston, Mass.
—SOLE AGENTS AND IMPORTERS.—

THE "HUSTLER" LAWN RAKE is reversible. It runs smoothly and rakes clean. Is light, yet strong. Self cleaning, teeth do not clog, nor can they get loose. A perfect rake for the lawn.



"HUSTLER" Post Hole Digger.

BUILT FOR BUSINESS.

Combines simplicity with correct form for easy and rapid digging. Made in the most thorough manner of the best material. Has new points of advantage.

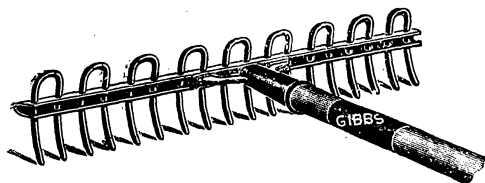
THE BOSS GARDEN RAKE possesses merits not found in other makes.

STRONG. CHEAP.

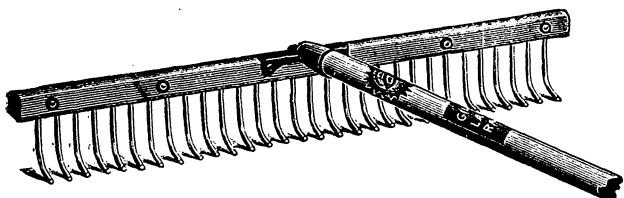
The double teeth are used for breaking clods, and will pulverize the ground finer and more quickly.

ALL STEEL. TINNED.

Can be used as a lawn rake, around stables, and on gravel walks.



THE CANTON LAWN RAKE has always given satisfaction, is the cheapest and one of the best the market affords.



We can quote on

8 styles of Lawn Rakes.

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JOHN H. GRAHAM & CO., } 113 Chambers St.,
—GENERAL AGENTS,— } **NEW YORK.**

BANNER Oil Lamp Stove.

Something **NEW, NOVEL** and **PRACTICAL!**

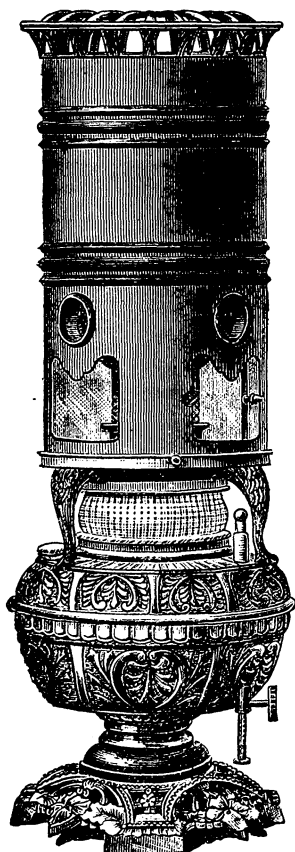
NO CHIMNEY NEEDED!

ECONOMY AND CONVENIENCE IN HEATING!

Capacity of Fount about One Gallon. Burns 10 to 12 hours and heats comfortably, at a nominal cost, a room 15 feet square. Especially valuable where only temporary heat is required—viz., Bed Rooms, Bath Rooms, etc. The draft is regulated by Inside Drum and Side Air Chamber, so **no Chimney** is required. The expense of Chimneys, as in other makes, is thus avoided. The Combustion is perfect, there is therefore **no Odor**.

The Fount and Base are Nickel Plated. The Body is made of Russia Iron. The round openings are so arranged that a continuous flow of Cold Air is drawn into the flame, which becomes heated and is thrown off with a Radiating Force very largely increasing the heating capacity of this Heater over any other now in the market.

To light or extinguish the Flame use the Sliding Door in the Drum. The entire top can be taken off to clean or re-wick. The Flame is regulated by our Improved Ratchet Movement, same as is used on our Celebrated Mammoth Banner Fount No. 858. The Nicety and Exactness obtained from this Movement is not possible with any other Wick Raising Device.



MANUFACTURED ONLY BY

No. 891 Banner Lamp Stove. Height 23 Ins.

THE PLUME & ATWOOD MANUFACTURING CO.,
18 MURRAY STREET, NEW YORK, U. S. A.

.... CAPITAL STOCK, \$200,000.

THE Daisy Burner

A Steady Heat
An Intense Heat
At All Times.

WM. KERR, Pres't, also Pres't Citizens' Nat'l Bank.

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J. D. FOSTER, Sec'y and Gen'l Mgr., also Pres't The Foster Stove Co.

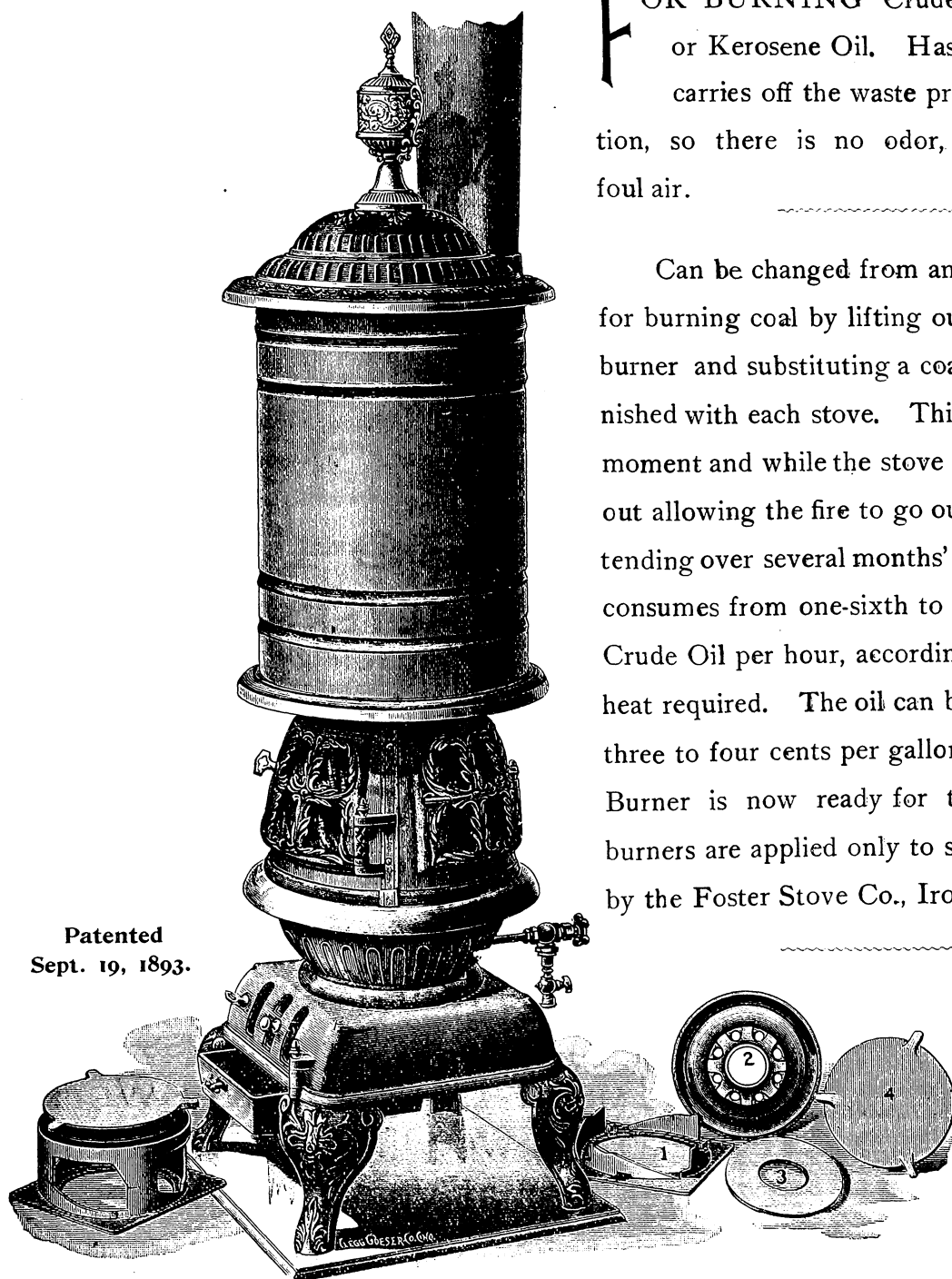
C. A. HAMMEL, Ass't Gen'l Mgr., Ironton, O.



FOR BURNING Crude Petroleum, Torch or Kerosene Oil. Has a stove pipe which carries off the waste products of combustion, so there is no odor, no smoke and no foul air.

Can be changed from an oil stove to one for burning coal by lifting out the top plate of burner and substituting a coal grate which is furnished with each stove. This can be done in a moment and while the stove is red hot and without allowing the fire to go out. Experiments extending over several months' time show the stove consumes from one-sixth to one-fourth gallon of Crude Oil per hour, according to the amount of heat required. The oil can be bought for from three to four cents per gallon. The Cook Stove Burner is now ready for the market. These burners are applied only to stoves manufactured by the Foster Stove Co., Ironton, O.

Patented
Sept. 19, 1893.



FOR full particulars and prices, address - - -

THE Ohio Crude Petroleum Oil Stove Co.,

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The Sun Manufacturing Co.

Successors to the Jno. M. Waddel Mfg. Co.,

ARE SOLE OWNERS AND MANUFACTURERS OF

**Waddel's Improved Coffee Mills,
Cathedral Gong Money Drawer and Surprise Rat Traps.**
Beware of Infringements.—We will protect our Patents.

"THE 'SUN' ONLY, SHINES FOR ALL."

A New Name, A New Reputation,

A New Line of Coffee Mills

That under the SUN Brand shine as leaders.

RAPID GRINDERS that will STAND THE WEAR.

STEEL ALLOY BUHRS,

A metal of recent discovery for this purpose used solely and only by the SUN. Warranted to outwear, outgrind and outsell any Coffee Mill ever put on the market.

We Challenge a Competing Test for Rapid Grinding and Wearing Surface.

Our New Line bears the Sun Trade Mark and is labeled Steel Alloy Buhrs.

Write for Our Catalogue and New Prices.

Order a Sample Mill.

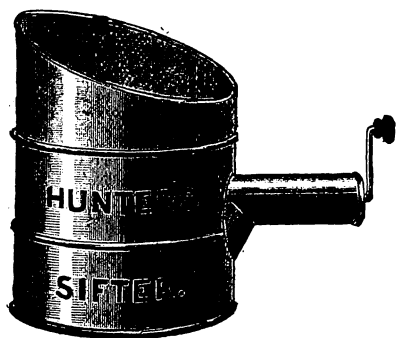
THE SUN MANUFACTURING CO.,

Greenfield, Ohio, U. S. A.,

MANUFACTURERS OF

Cash Registers, Money Drawers, Coffee Mills and Wooden Ware Specialties.

They're All the Best (?)



But why don't they sell like the Hunter? The reason is obvious; none of them have stood the test like this, the Pioneer of them all and which to-day still stands at the head. Send in your specifications now for

1894.

The FRED J. MEYERS MFG. CO.,

COVINGTON, KY.

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Law without Lawyers.

**A Compendium of Business
and Domestic Law for
Popular Use.**

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A simple, clear and accurate presentation of the general laws, and of the laws of the several States relating to the rights of property, contracts, debts, partnerships, bankruptcy, insurance, corporations, marriage, divorce, &c., &c., with which are included correct copies of all legal instruments and forms, such as notes, deeds, mortgages, leases, wills, &c., and a dictionary of legal words and phrases.

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Fine Show Cases Cheap.

We have half a dozen beautiful cherry wood, plate glass show cases used by us at the World's Fair which we will sell separately or together at very low prices.

If interested write for particulars.

JOS. DIXON CRUCIBLE CO.,

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Stone
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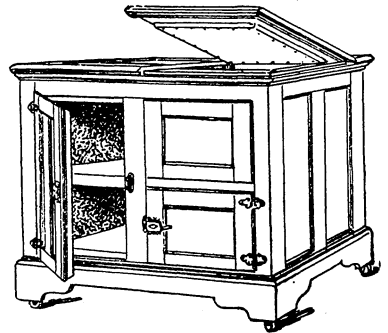
Refrigerators

SEAMLESS vitrified and glazed earthenware Provision Compartments. Practically indestructible; won't sweat, because of Perfect Dry Air Circulation. Liberally filled with the best Mineral Wool, and first-class in every particular Perfect cleanliness. No foul odors. Indurated Fiber Ice Racks that will not leak.

Quality Same, But Prices Lower.

WRITE FOR CATALOGUE AND DISCOUNTS.

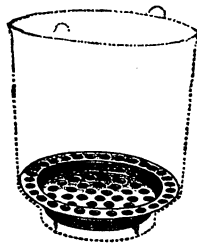
Monroe Refrigerator Co., = = = Lockland, Ohio.



SAFETY KETTLE BOTTOM.

Made from STEEL.

Prevents meats and vegetables from burning while cooking. Can be used for various purposes, either as Steamer, Broiler, Toaster, etc.



Cannot be Broken.

Can be used for various purposes, either as Steamer, Broiler, Toaster, etc.

PATENT APPLIED FOR.

FOR PARTICULARS ADDRESS,

DIAMOND HARDWARE CO., 620 ATLANTIC AVE., BOSTON, MASS.

No. 4 ALL RATTAN BROOM.

Made for Switch, Snow, Yard, and all purposes to which an All Rattan Broom is especially adapted. It has been thoroughly tested, and our patent fastening is conceded to be the best, most convenient, and holds the rattan more firmly and in better shape than any other ever introduced. A trial will insure its continued use. We make a specialty of

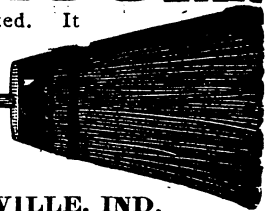
BROOMS and BRUSHES

FOR

RAILROADS, SHOPS, WAREHOUSES, STREET, STABLE, BLOOM, CHILL, CASTING AND MOULDING PURPOSES. Write

JOSEPH LAY & CO.,

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GOLDEN CROWN WARE.

EXCLUSIVE SALE IN EACH TOWN GIVEN.

Allowance towards Advertising

Be Quick if you want Control of your City.

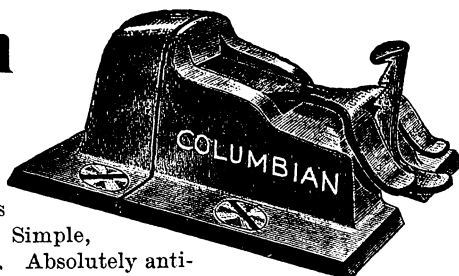
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THE STUART & PETERSON CO.,
Burlington, N. J., U. S. A.

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Sash

Locks three ways with one motion. Simple, strong and durable. Absolutely anti-rattle and burglar proof. Sample by mail, 35c.

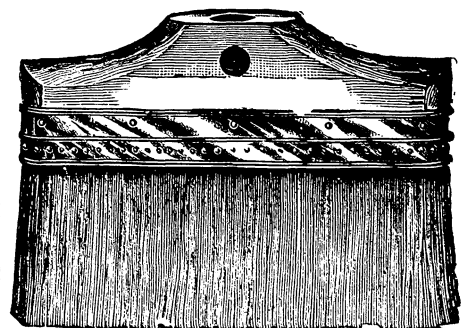


Lock.

COLUMBIAN SASH & DOOR LOCK CO.,
WAUSEON OHIO.

BRUSHES

FOR THE



Hardware Trade,

Whitewash, Horse, Paint, Window, Shoe,

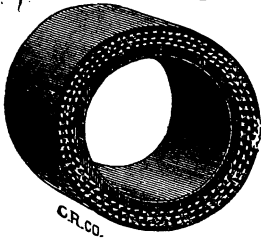
And Every Variety of Brushes and

Wire Goods.

Close prices and prompt shipments. Get samples and catalogue for the asking.

Cincinnati Mfg. Co., Cincinnati, O.

NEW SEAMLESS TUBE



SALES OF
Over Two Million Feet

GARDEN HOSE

alone during the past year, distributed throughout the United States, and not a single piece complained of, justifies us in guaranteeing that it will give absolute satisfaction.

Who Has Not Had Bad Hose ?

Who has not lost time, patience, money, by attempting settlement for such goods ?

THE CAUSE in nine cases out of ten is the lapped seam.
THE REMEDY is in buying our

PATENT SEAMLESS TUBE HOSE,

made by machinery, the tube run like lead pipe, through a die. There is no lapped tube, no seam, no cracks, no defects; water cannot get through to rot the duck and cause the hose to burst.

Made in All Sizes and Kinds of Garden, Engine, Steam, Fire, Brewers' Cotton Hose, &c.

Order a Sample Bale of our Seamless-Tube Hose—Best in the World, costs no more than ordinary lapped-seam hose. The different colors, Red, White, Black, Green and Yellow, make a fine window or sidewalk attraction.

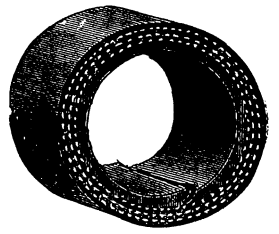
CLEVELAND RUBBER WORKS

of the Mechanical Rubber Co.,

CLEVELAND, O.

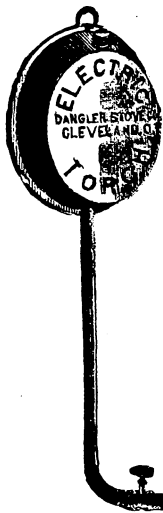
Makers of Mechanical Rubber Goods, Clothing, Druggists' Sundries, Specialties, Etc.

OLD LAPPED TUBE



We were awarded an order of 25,000 ft. for World's Fair of our celebrated
Seamless-Tube
COTTON RUBBER-LINED HOSE

We Want Your Trade.
Send for 60-page Catalogue.
Write for Prices and Samples.



Dangler Electric Torches

FOR
GASOLINE
OR
OIL.

14 JETS OF LIGHT



3 to 6
INCHES
LONG.

FOR lighting manufacturing establishments, such as Rolling Mills, Foundries, Machine Shops, Engine Rooms, &c., &c., with a convenient, portable, brilliant, steady light, and by cheaper means than by Coal Gas

SOLE MANUFACTURERS,

The Dangler Stove & Mfg. Co.,
Cleveland, Ohio.

ACME CUTTING TOOLS.

Made in all Sizes.



SOLID STEEL ACME PLIER
AND WIRE CUTTER.
Made with cutters of best steel.

ACME CUTTING NIPPER.
Jaws of choicest Tool Steel, dovetailled into the head, making it as strong as solid steel.



STANDARD STOVE PIPE SHELF.

HIGGANUM HARDWARE CO., HIGGANUM, CONN.

New York Office, 18 Cliff Street.

PHILLIPS SCREENS

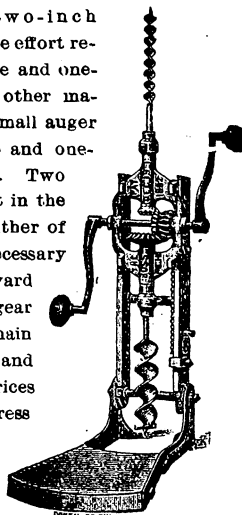
Are Reliable.

The Boss 2-speed Boring Machine.

Will operate a two-inch auger with the same effort required in using one and one-half inch in any other machine, and for the small auger have a speed two and one-half times faster. Two augers may be kept in the machine, to use either of which it is only necessary to point it downward by first taking the gear frame out of main frame, inverting and replacing it. For prices and discounts address

Buckeye Mfg. Co.

Union City, Ind.

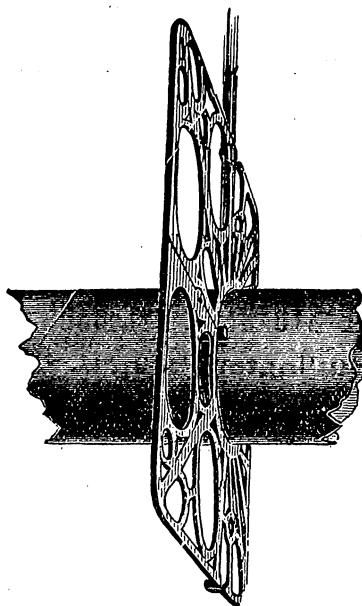


The Henry C. Hart Mfg. Co.

DETROIT, MICH.,

MANUFACTURERS OF

HARDWARE SPECIALTIES.

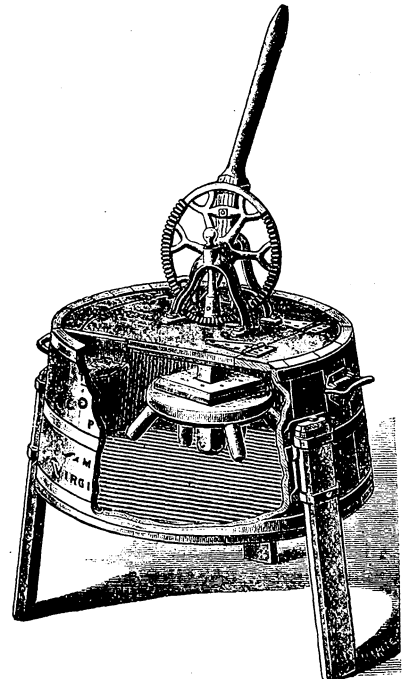


Phillips Screens

FOR DOORS AND WINDOWS, ARE WELL
MADE, FROM GOOD MATERIALS BY

A. J. Phillips & Co., Fenton, Mich.

Columbia Washing Machine.



1. The Columbia is made of the finest VIRGINIA WHITE CEDAR and will last a lifetime.
2. It has EXTRA HEAVY CASTINGS and HOOPS, and is the ONLY machine on the market with ALL HOOPS, CASTINGS and TRIMMINGS GALVANIZED. It will NOT stain the clothes.
3. The BOTTOM and SIDES are corrugated on the inside of the washer ONLY.
4. The bottom of the Columbia is in the LARGE END, thus preventing clothes from WEDGING. Write for prices.

RICHMOND CEDAR WORKS,
RICHMOND, VA.

SEND FOR CATALOGUE.

DO YOU USE

LEATHER PARTS,

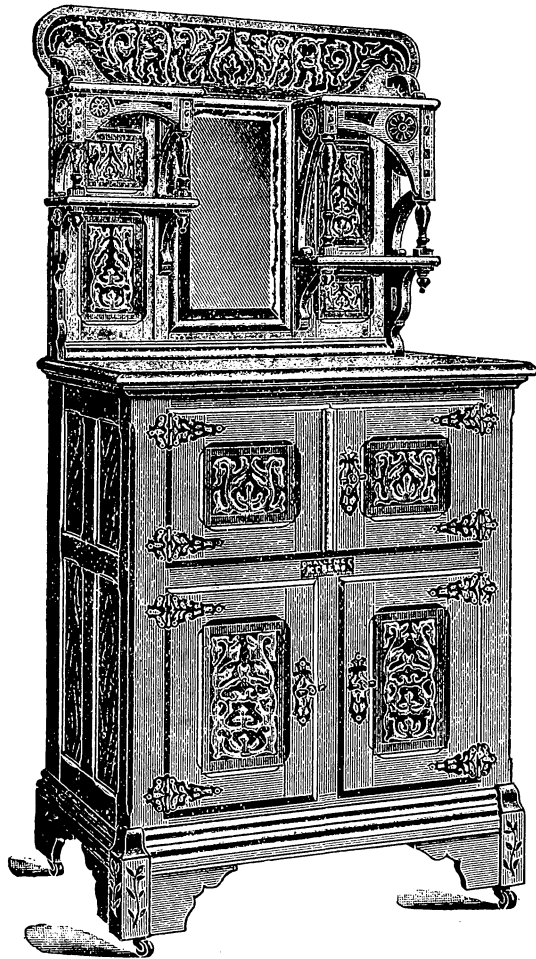
Straps, Washers, or Special Shapes in
Leather, hand or machine sewed
Leather Work of any description,

Skate Straps or Mountings

Write for Estimates, mentioning this paper,

J. FRANK GREENE,

278 Water and 14 Dover Sts., NEW YORK.



BUY THE BEST. THE Challenge Iceberg Refrigerators,

MANUFACTURED BY

The Challenge Corn Planter Co.,
Grand Haven, Mich., U. S. A.

Write for our large Illustrated Catalogue for 1894.

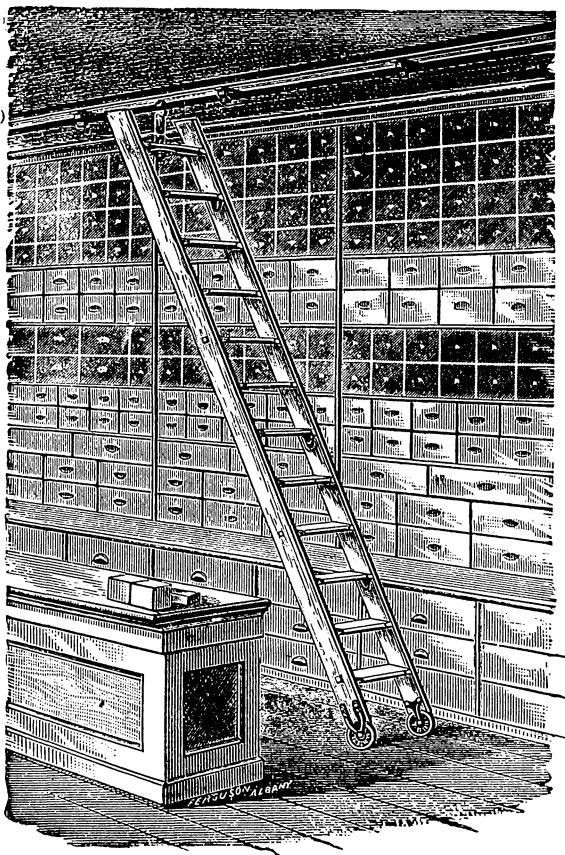
All our goods are made of thoroughly kiln dried ash, finished in antique with shellac and coach varnish. Panels are beautifully hand carved. Trimmings are of solid bronze and are our own pattern. We use our own patent air tight locks, patent self-retaining malleable casters and floor plates, and patent drip cups. All refrigerators are filled with pure charcoal. The Challenge Iceberg Refrigerators are the best made for preserving all articles stored therein pure and sweet, as there is always a circulation of pure, dry, cold air. Refrigerators having water coolers are provided with bronze faucet and cup holder. All Sideboards have a fine beveled French plate mirror. We manufacture Refrigerators of all sizes from the ordinary Ice Chest to the largest sizes for grocers' and butchers' use, including the most elegant line of Dining Room Sideboard Refrigerators ever put on the market.

GENERAL AGENTS:

F. T. Witte Hardware Co., New York, N. Y.
D. W. Cushing, Boston, Mass.
F. M. Borden & Bro., Phila., Pa.
Simmons Hardware Co., St. Louis, Mo.
Buhl, Sons & Co., Detroit, Mich.
Kent & Stuchfield, Denver, Col.
Chicago Stamping Co., Chicago, Ill.

Lee-Clarke-Andreesen Hardware Co., Omaha, Neb.
John Pritzlaff Hardware Co., Milwaukee, Wis.
A. Baldwin & Co., New Orleans, La.
Gurney Refrigerating Co., Oakland, Cal.
Wm. Miller Range & Furnace Co., Cincinnati, O.

THE "NOISELESS" STORE LADDER.



The latest and best. Perfectly noiseless. Neat in appearance.

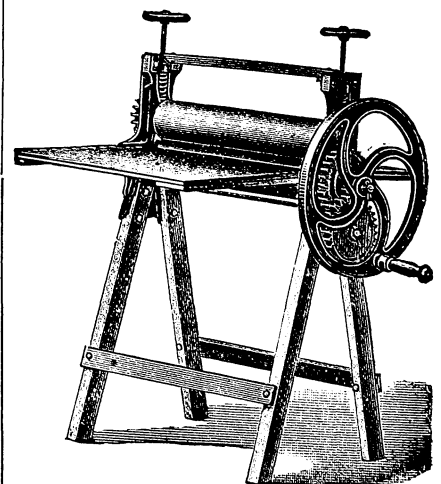
Manufactured by
M. CROISSANT,
ALBANY, N. Y.

The Family Mangle.

WARRANTED TO DO
Better Work than Hand-Work.

SAVES all the fuel.
two-thirds the work.
Keeps the linen whiter.

We Guarantee Every Machine.



Send for descriptive circular to
S. C. Johnson, Racine, Wis.
Agents Wanted.

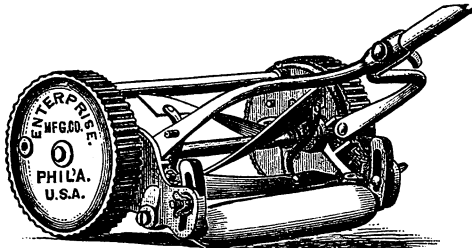
COMMON MOUSE TRAPS
BEST FOR USE!

Ripley Mfg. Co., Unionville, Conn.



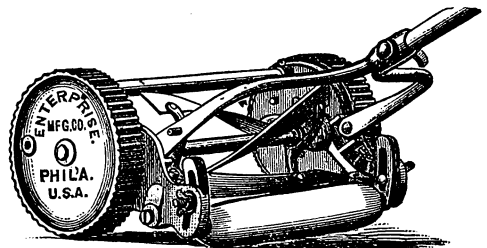
Porcelain-Lined Lemon Squeezers, Steak Hammers, Boot Jacks, Magnetic Tack Hammers, Mallets, Bung-Starts, Hand Screws, Beacon Hill Pat. Mouse Traps, Sunny-Side 2 lb. Lap Board.

THE ENTERPRISE M'FG CO. OF PA., Third and Dauphin Sts., Philadelphia, U. S. A.

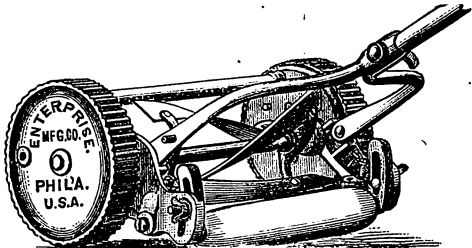


7, 9, 11, 13, 15 inches.

—O—
PAINTED
and
TINNED.

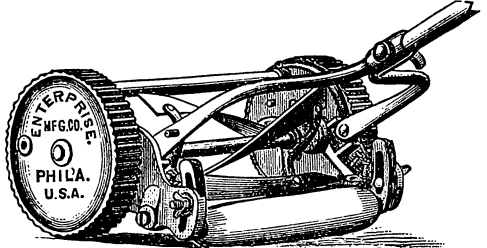


ENTERPRISE LAWN MOWERS!



EQUAL TO
the
BEST.

—O—
Prices quoted
on Application.



FOR SALE BY THE HARDWARE TRADE.
Branch Office and Warehouse with J. C. McCarty & Co., 97 Chambers Street, New York City.

SEND FOR CATALOGUE, FREE.

Reliable Torches are
what you want.



Made either for Oil or
Gasoline.

These Torches are particularly adapted for use in Factories, Foundries, Machine Shops, Rolling Mills, Blacksmith Shops, Warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner.
Write us for prices. A liberal discount given to the trade.
Manufactured by
THE SCHNEIDER & TRENKAMP CO.,
Nos. 479 to 497 Case Ave., Cleveland, Ohio.

LIGHT YOUR DARK SHOPS CHEAPLY.

Give your men plenty of Light and they will do double work.

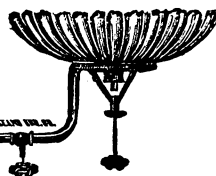


The Wall Torch has been used for several years as a means of illumination in Mills, Foundries, Machine and Car Shops, Tunnels, Street Stands, Band Stands, Smith Shops, etc.

While there are many cheap, inferior torches made which injure the sale of a good article, and condemn the Torch in general, our "Incandescent" Wall Torches are recognized as the best, and are now in use in the largest manufacturing establishments in the country giving **PERFECT SATISFACTION**, as is evidenced by the **DUPLICATE ORDERS** we receive from year to year.

They burn 150° Coal Oil, or 74° Naphtha, requiring a different burner for each.

— In ordering be careful to state which is desired.



Price, for Single Torch, complete, \$2 each.

SPECIAL PRICE QUOTED FOR QUANTITIES.

THE STANDARD LIGHTING CO.,

100 to 118 Perkins Ave.,

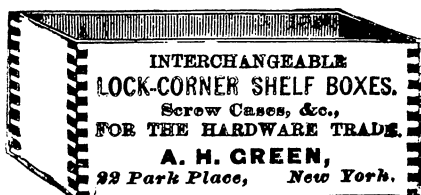
Cleveland, Ohio,

American Stamping Co.,

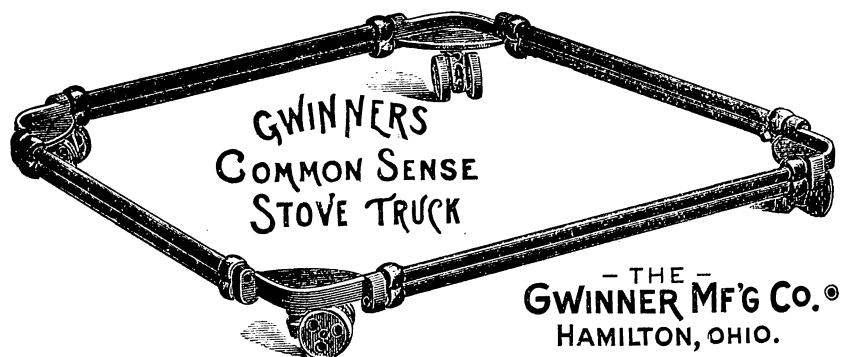
Manufacturers of

All Kinds of Tinware and Sheet
Metal Goods.

N. Y. Office and Salesroom, 104 & 106 John St.
Factory, 103 to 119 N 3d St., Brooklyn, E. D., N. Y.



INTERCHANGEABLE
LOCK-CORNER SHELF BOXES.
Screw Cases, &c.,
FOR THE HARDWARE TRADE.
A. H. GREEN,
99 Park Place, New York.



WINNERS
COMMON SENSE
STOVE TRUCK

— THE —
GWINNER M'FG CO.®
HAMILTON, OHIO.

CLOTHES WRINGERS. COLBY WRINGER CO.,

MONTPELIER, VT.
HAVE YOU Our Price-List?



THE STANLEY WORKS

NEW BRITAIN CONN.

77 CHAMBERS STR.

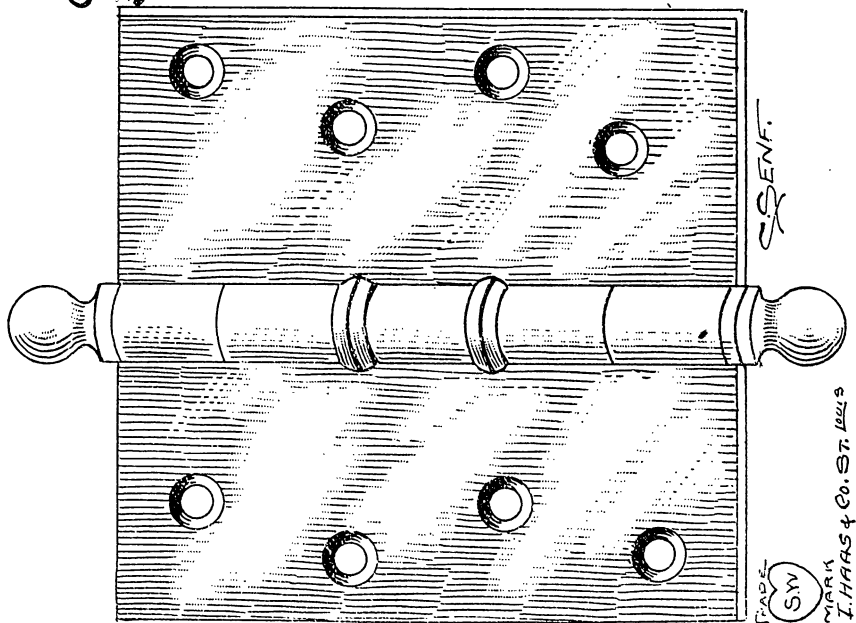
NEW YORK.

MAKERS OF

STANLEY WROUGHT STEEL BUTTS AND HINGES

WE DESIRE TO CALL SPECIAL ATTENTION TO OUR BALL BEARING STEEL BUTT HAVING THE FOLLOWING ADVANTAGES.

- 1ST NO FRICTION IN THE JOINT, CONSEQUENTLY NO WEAR.
- 2ND NO OIL OR GREASE TO DISFIGURE FINISHES AND GATHER DUST.
- 3RD NO SQUEAKING OF DOOR.
- 4TH NO WORKING UP OF PIN.



SEN.

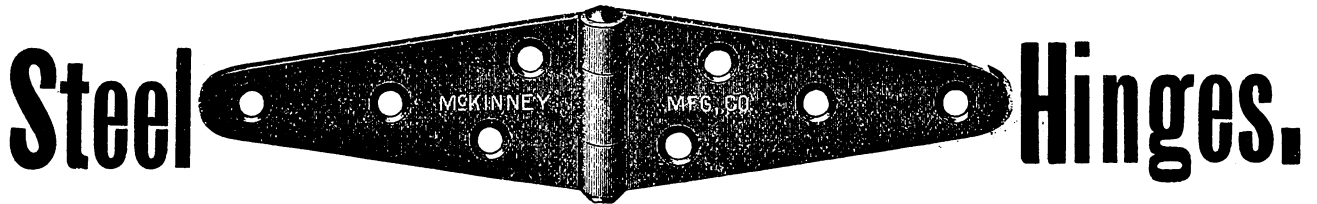


J. HARRIS & CO. ST. LOUIS

WE CLAIM

That one pair of our Celebrated Steel Hinges will outwear two pair of the Flimsy Invention now being forced upon the attention of the trade.

McKINNEY MFG. CO., ALLEGHENY, PA.



SEND FOR LIST.

"NONE BETTER."

BARN, MILL AND FIRE DOOR HANGERS HIGHEST AWARD

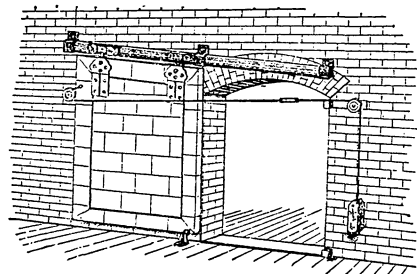
at WORLD'S FAIR, 1893,

— : ON : —

Parlor, Barn and Fire Door
Hangers.

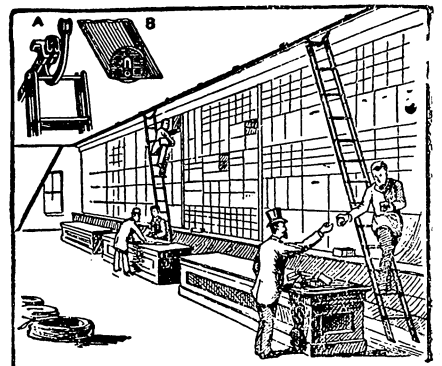
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COBURN TROLLEY TRACK MFG. CO.
HOLYOKE, MASS.



Fire Door Hangers. Best in the World. Equipped with Automatic Fire Door Fittings.

We make four styles of ROLLING LADDERS to reach shelving of any height.



P. & F. CORBIN,

New Britain, Conn.

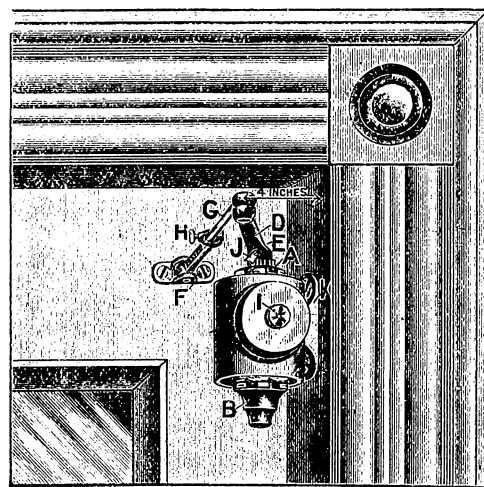
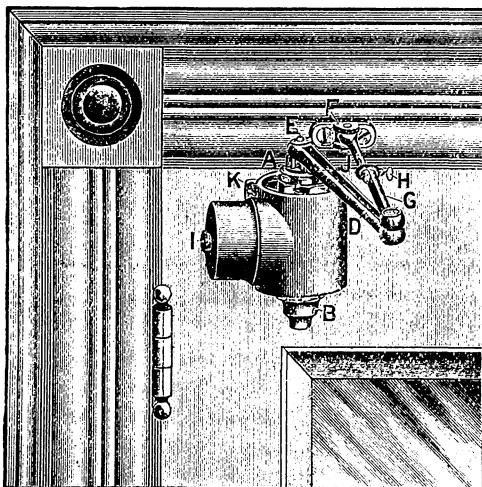
New York.

Philadelphia.

Chicago.

—) MANUFACTURERS OF (—

Easily
Adjusted
and Adapted
for all
Requirements.

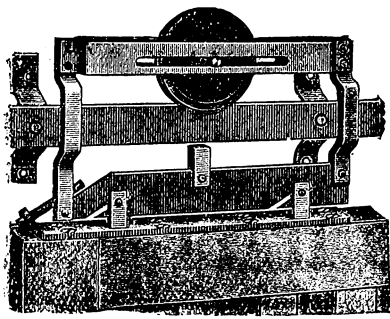


Looks Well,
Acts Well,
Wears Well.

LIQUID DOOR CHECKS AND SPRINGS,

Fine Builders' Hardware. Wood AND Machine Screws.

Catalogues and Prices Furnished on Application.



LANE'S PATENT NOISELESS STEEL PARLOR DOOR HANGER.

This Hanger is made of Steel.
The Wheel is also Steel, except the filling or tread.
The Track is of Steel—a single one only.
The Hanger is Anti-Friction.
More nearly Noiseless than any other.
Ease of adjustment.

Can be erected with half the labor others require.
Track will not swell, shrink or warp out of true.
No cutting of doors.
No matching of hardware.
Simplicity in all its parts.
Durability.

ALSO LANE BARN DOOR HANGER AND TRACK. SEND FOR CIRCULARS.

Manufactured by

LANE BROS., Poughkeepsie, N. Y.

JOHN H. GRAHAM & CO., General Agents, 113 Chambers St., New York.

He had in his possession 55 skeleton keys which the police claim would open any door.
—Chicago Tribune.

You are selling that kind of a lock every day and your customers think you are selling the best the market affords.

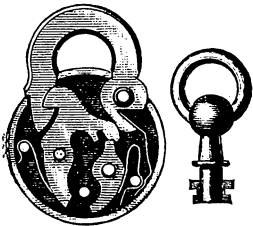
ARE YOU SELLING the best the market affords?

The Craig Locks are guaranteed Sneak Thief Proof.

Send for Catalogue

KEYLESS LOCK CO., I. A. 197 So. Canal St., Chicago, Ill.

PATENT PERFECTION PADLOCK.



Eight Tumblers, Key Turning Both Ways.

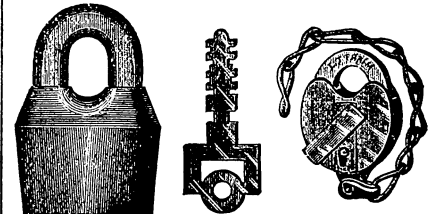
Sizes, $\frac{3}{4}$ inch to $2\frac{1}{4}$ inches, of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also, $\frac{1}{2}$ and $\frac{3}{4}$ inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world.

Adopted by the United States Treasury for bonded warehouses.

AMES SWORD CO., Chicopee, Mass.

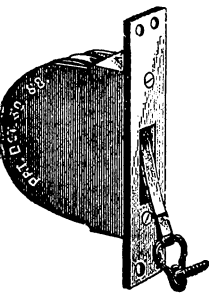
Send for Price-Lists and Circulars.

ESTABLISHED 1879.
KEYSTONE LOCK WORKS,
E. T. FRAIM, Lancaster, Pa., U. S. A.



Originators, designers, patentees and manufacturers of all the leading popular styles of **PADLOCKS**, Key-Locking Scandinavian with our patent Inter-Locking Tumblers; the only reliable lock of this style ever made. **SELF-LOCKING** Scandinavian of the highest type of perfection. Dust Proof Railroad, Freight Car and Switch Padlocks. Brass, Bronze, Steel and Malleable Iron Padlocks for all purposes and in all finishes. 131 different kinds. Write for our new 100-page catalogue.

SURPLESS, DUNN & ALDER, General Agents,
97 Chambers St., NEW YORK.



DOES IT PAY?

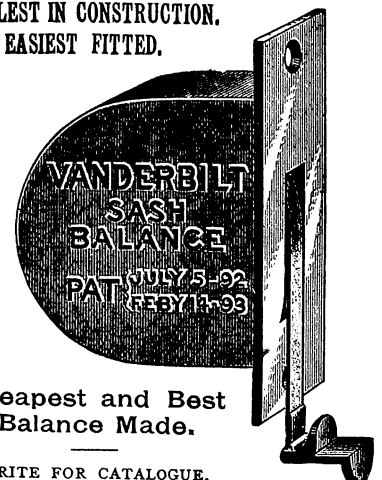
To buy an inferior article, which your trade condemns, when you can get

THE CALDWELL SASH BALANCE.

The best material, right principle and care in making and testing have made it the **LEADER** for five years. Write to

CALDWELL MFG. CO., Rochester, N. Y.

SIMPLEST IN CONSTRUCTION.
EASIEST FITTED.



**Cheapest and Best
Balance Made.**

WRITE FOR CATALOGUE.

The Vanderbilt Sash Balance Co.,
CANANDAIGUA, N. Y.
General Agents, Harmon & Dixon, 118 Chambers St.
New York.



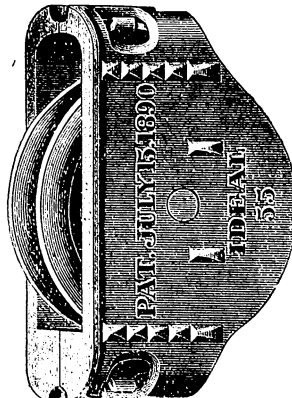
SASH WEIGHTS

E. E. BROWN & CO.,

McKean and Meadow Sts.,

PHILADELPHIA, PA.

Ideal Sash Pulley, No 55.



Adapted for auger socket or machine made mortise. Applied without chisel or screws, quickly and a perfect fit in every case. The only all round Sash Pulley made. Sample free. Price on application.

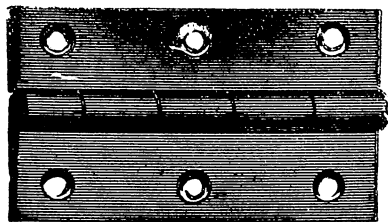
STOVER MFG. CO.,

145 River St., Freeport, Ill.

C. H. WOLFF,
177 William St., N. Y.

STEEL ALPHABETS
STEEL NAME STAMPS
BURNING BRANDS
STENCIL DIES.

Send for Catalogue.



Cast Brass Butt Hinges

IN STOCK AND FOR SALE BY

W. & J. TIEBOUT,

Nos. 16 & 18 Chambers Street, New York,

MANUFACTURERS OF

**BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.**

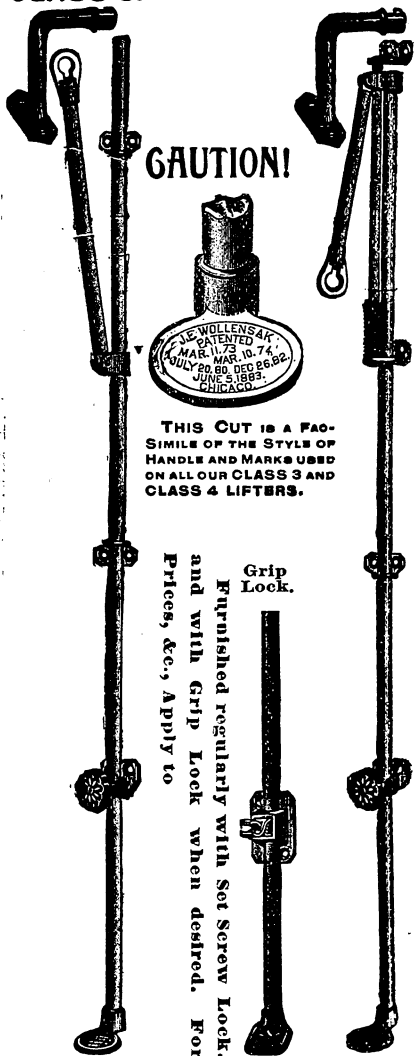
Transom...Lifters

OLD RELIABLE

J. F. WOLLENSAK'S PATENT.

CLASS 3.

CLASS 4

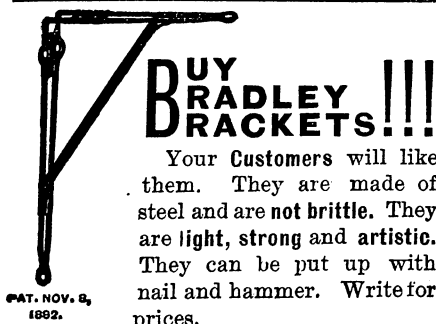


CAUTION!

THIS CUT IS A FAC-
SIMILE OF THE STYLE OF
HANDLE AND MARKS USED
ON ALL OUR CLASS 3 AND
CLASS 4 LIFTERS.

Grip Lock.
Furnished regularly with Set Screw Lock,
and with Grip Lock when desired. For
Prices, &c., Apply to

J. F. WOLLENSAK, - CHICAGO, ILL.

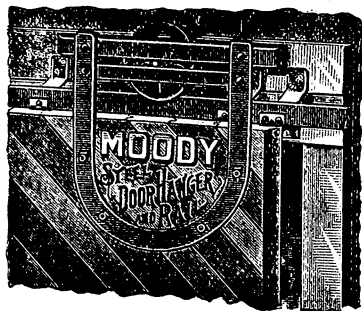


BUY BRADLEY BRACKETS!!!

Your Customers will like them. They are made of steel and are not brittle. They are light, strong and artistic. They can be put up with nail and hammer. Write for prices.

ATLAS MFG. CO.,
New Haven, - - Conn.

VICTOR MFG. CO., Newburyport, Mass. STEEL RAIL.



Showing one-half set of hangers attached to door.



The Only Bracing Bracket Made.

PRICE-LIST.

| HANGERS. | Per Doz. prs. |
|---|---------------|
| No. 5, to run 6 feet, 3 1/4 in. wheel, | - \$10.00 |
| No. 6, to run 10 feet, 4 1/4 in. wheel, | - 15.00 |
| No. 7, to run 15 feet, 5 1/4 in. wheel, | - 22.00 |
| RAIL, per foot..... | 6 1/4 cent |

New Goods We have just completed a new line of Locks and Bronze Trimmings for Fine Cabinet Work, French Windows and Narrow Stile Inside Doors.

WAREHOUSES:

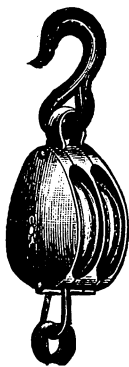
NEW YORK, PHILADELPHIA, CHICAGO.

Factories, READING, PA.

**Reading
Hardware
Company.**

WHY USE WOODEN OR HEAVY STEEL BLOCKS

WHEN THE STEEL AND IRON



TACKLE BLOCKS

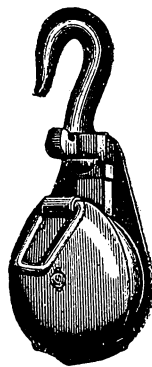
—MADE BY—

The Cleveland Block Co.

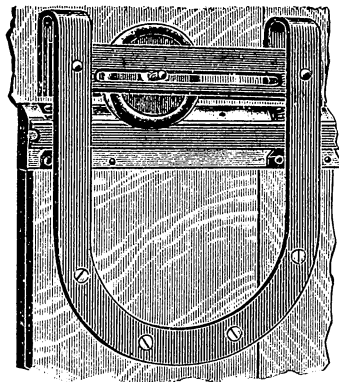
CLEVELAND, OHIO, U. S. A.,

ARE BETTER IN EVERY WAY.

No waste material. Every ounce of weight in the line of strength. No clumsy outside straps or bolts. As light as wooden blocks and vastly more durable. They wear, but never break. Sheaves interchangeable.



General Agents: Topping Brothers, 92 Chambers Street, New York
The H. Channon Co., 22 Market Street, Chicago.
New England Agents, - Dodge, Haley & Co., 212 High Street, Boston.



HIGHEST AWARD
WORLD'S
COLUMBIAN EXPOSITION

BARN DOOR HANGERS.

For catalogue and prices, address

Chicago Spring Butt Co.,

CHICAGO, ILL.,

or 97 CHAMBERS ST., N. Y.

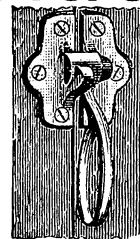
P. J. Conroy & Co.,

Paschall, PHILADELPHIA.

"CONROY"

Refrigerator Door

Fasteners



Have rapidly supplanted all others.

Pat. Dec. 15, '85 Refrigerator Trimmings.

JESSE JONES & CO.,

HARDWARE SHELF BOXES

Made of Wood.
No screws or
nails used to work
out and cut
your shelving

615 & 617 Commerce St., Phila.
Send for circular and list of references.

PHILLIPS SCREENS

Are Reliable.

Highest Award

FOR

Supreme Excellence

TO

The PUTNAM Hot-Forged and

Hammer-Pointed Horse NAILS,



At the *World's Columbian Exposition* at Chicago. A medal and diploma worded :
"Supreme excellence in material, method in manufacture, and quality of finished product; elasticity and smoothness combined with holding power in clinch.
It allows the use of very small nails."

There is nothing beyond "supreme excellence," nor is there anything comprised in a horse nail, except the "material from which it is made," "the method of manufacture," and "quality of finished product."

Putnam nails, by their "elasticity," give slightly to the expansion and contraction of the hoof while the horse is in motion; by their "smoothness," do not enlarge the nail holes in the hoof, while their "supreme excellence," in "holding power in the clinch," enables them to hold the shoe in the hardest service until worn out.

By the "use of small nails," large holes are avoided and money saved to the smith.

Thus it will be seen that the officials of the *World's Columbian Exposition* recognize what qualities go to make up a good horse nail and that only the "Putnam" contains them all.

PUTNAM NAIL CO.,

Neponset, Boston, Mass.



All Tags and Labels on Covert Goods bear the above Trade-Mark, and are sold by all Leading Jobbers in General and Saddlery Hardware at Manufacturers' Prices.



COVERT MFG. CO.,

WEST TROY, N. Y.

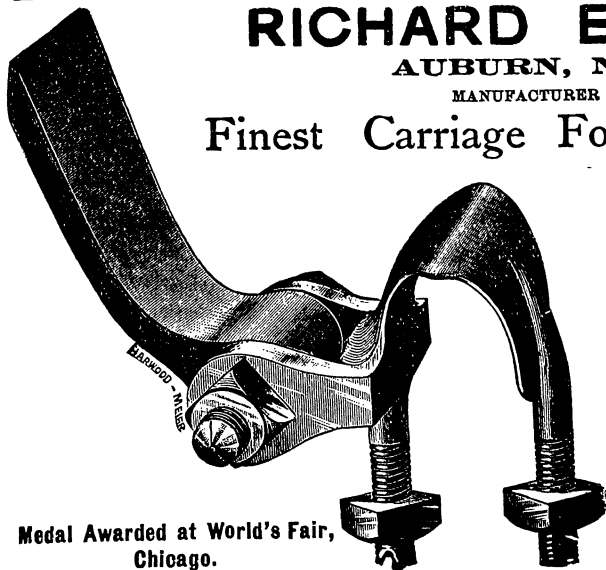
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Special Drop
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Cut One-half Size.

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**A Full Line of Carriage Hardware
ALSO SPECIAL FORGINGS.**

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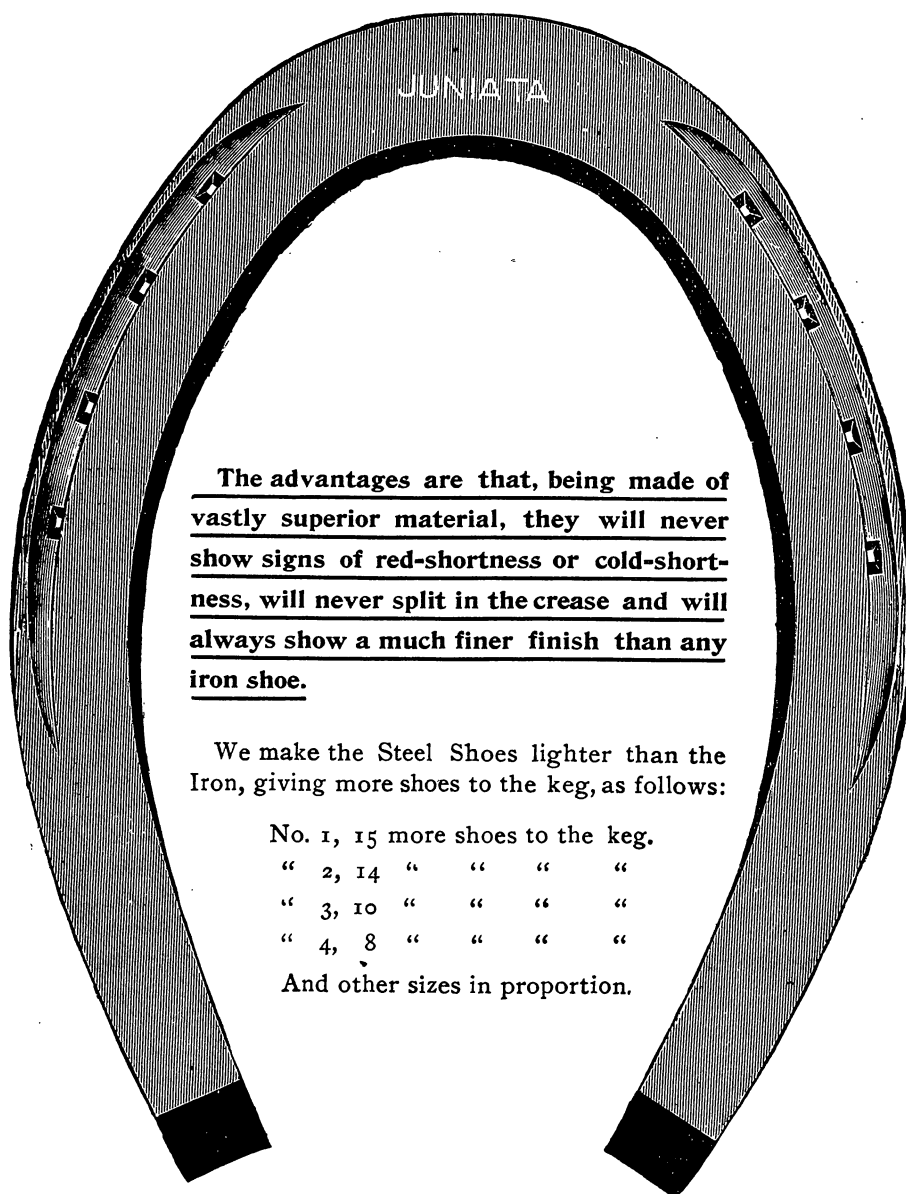
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After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes, and are now making from this steel, Extra Swaged, and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



The advantages are that, being made of vastly superior material, they will never show signs of red-shortness or cold-shortness, will never split in the crease and will always show a much finer finish than any iron shoe.

We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows:

No. 1, 15 more shoes to the keg.

" 2, 14 " " " "

" 3, 10 " " " "

" 4, 8 " " " "

And other sizes in proportion.

No. 2 EXTRA SWAGED HIND.

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

We would also call your attention to our Improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities use sand or borax in welding on a calk and cool off at a dark red, or still better, cool off without plunging in water. We make sizes numbers 1, 2, 3, 4, 5 and 6, packed in 25-pound boxes.

Write to us for information and prices, or apply to jobbers and dealers, who sell them everywhere.

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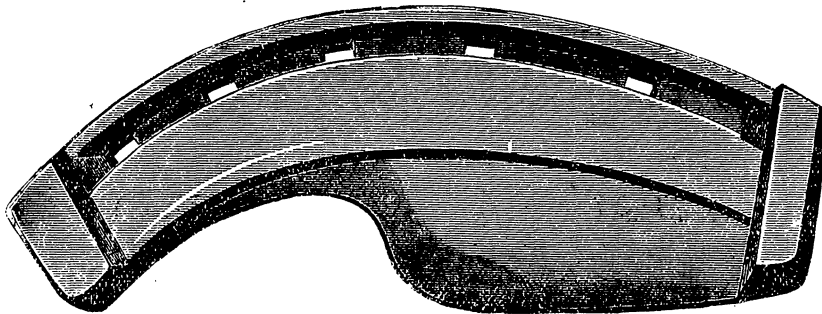
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CARRIAGE HARDWARE AND SPECIAL DROP FORGINGS.

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SHOES.



Made under Deebie's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

IT IS JUST RIGHT.



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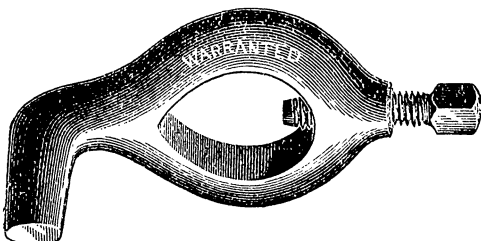
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With Steel Screws. U. S. Standard and the points hardened.



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| One small set of 8, by 1/4 in. to 2 in. 6 25 | | | | | |
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HORSE AND MULE SHOES.

LEEDS, ROBINSON & CO., General Agents,

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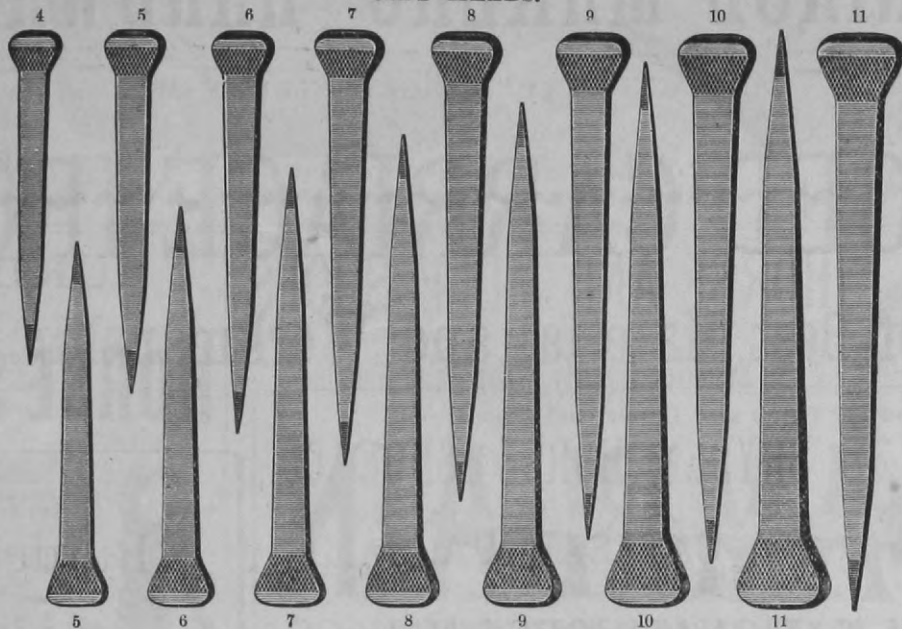
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"Tensile strength one-half greater than that of any other nail made."

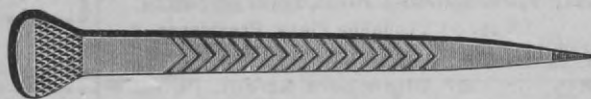
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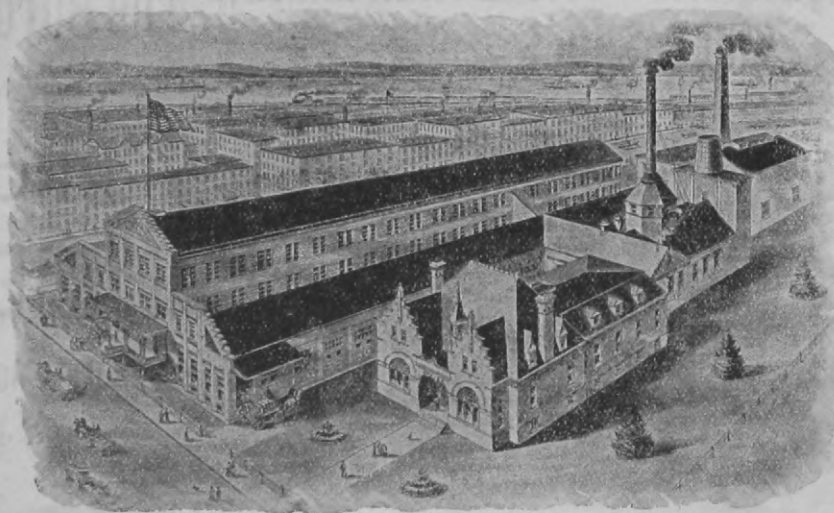
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Needs no
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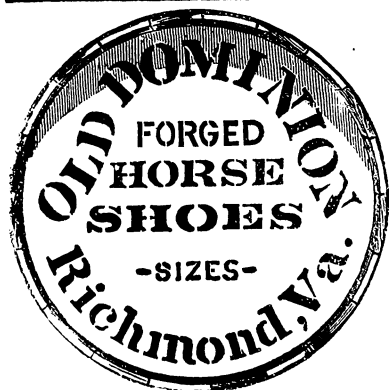
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All Sizes. All Patterns. All Warranted. Sold Everywhere.

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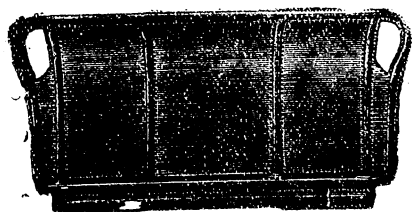
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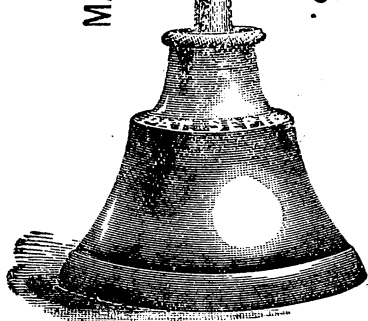
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Strongest in the market.

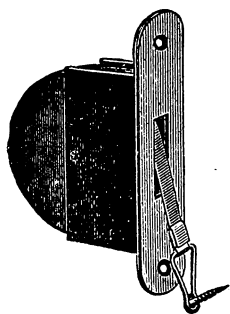
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Endorsed by the Architect

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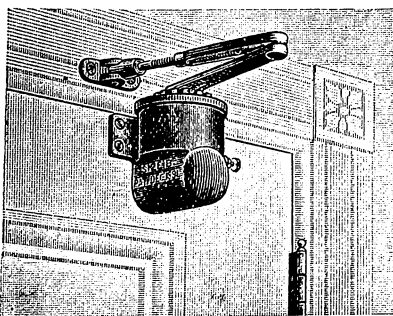


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Can be used in
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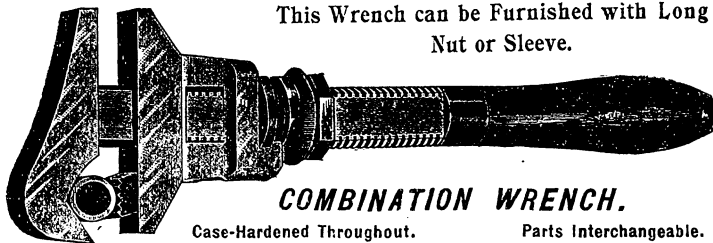
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Perfect in action, durable, neat in appearance, low
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This Wrench can be Furnished with Long
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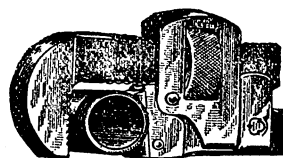
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Case-Hardened Throughout.

Parts Interchangeable.

This wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the
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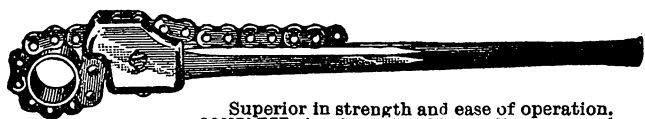
TRIMO PIPE WRENCH,

Forged Steel

All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no
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WRENCH.**



Superior in strength and ease of operation.
COMPLETE circular grip. Never slips nor crushes.

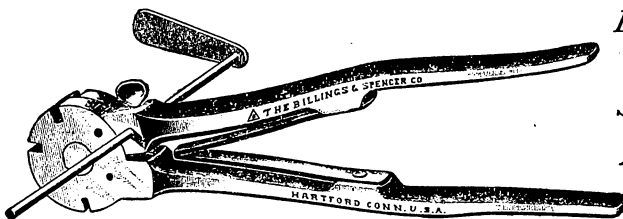
Can be used with one
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Wrench. Parts Interchange-
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THE BILLINGS WIRE CUTTER



Drop forged from
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Six Cutting Edges

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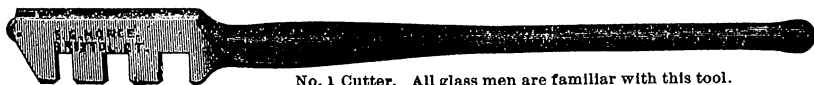
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No. 1 Cutter. All glass men are familiar with this tool.

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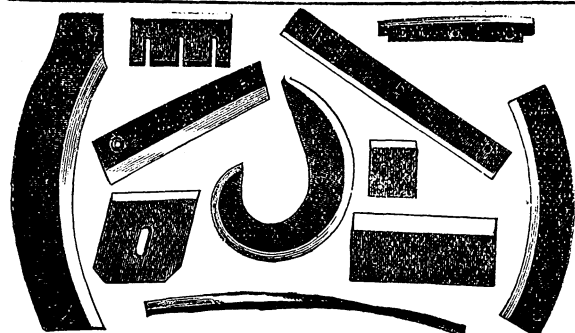
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CAST STEEL HIS HATCHET.
HATCHET FOR "I CANNOT TELL A
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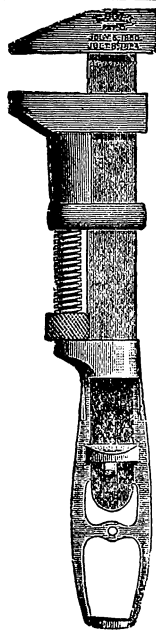
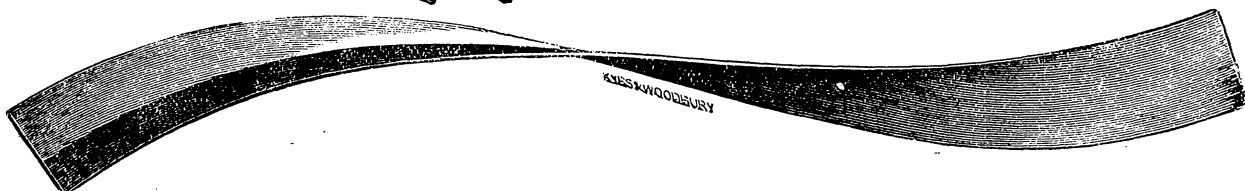
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Genuine Improved
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Screw Wrenches

MANUFACTURED BY
COES WRENCH CO.,
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Established in
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Patented July
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Sectional View Illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position.

1/2" Straight Bar, Extra Long Nut for Screw in Jaw.

The BEST MADE and STRONGEST WRENCH in the MARKET.

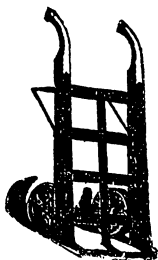
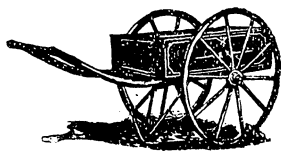
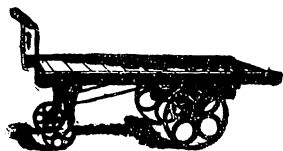
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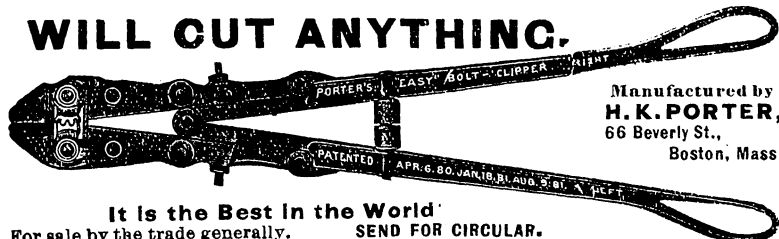
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These Dogs are forged from mild steel, giving the greatest strength and toughness for the least weight, while they are heavier than Dogs of corresponding sizes made elsewhere.

The cross section is shaped similarly to an ogee, forming a rib on the back, by which the metal is utilized to greatest advantage at the point of severest strain.

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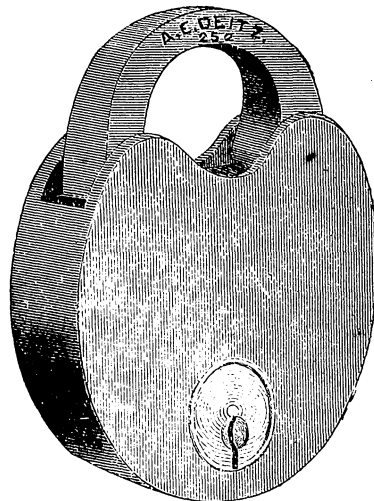
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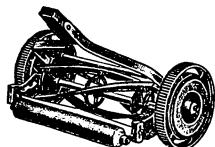
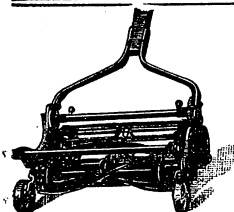
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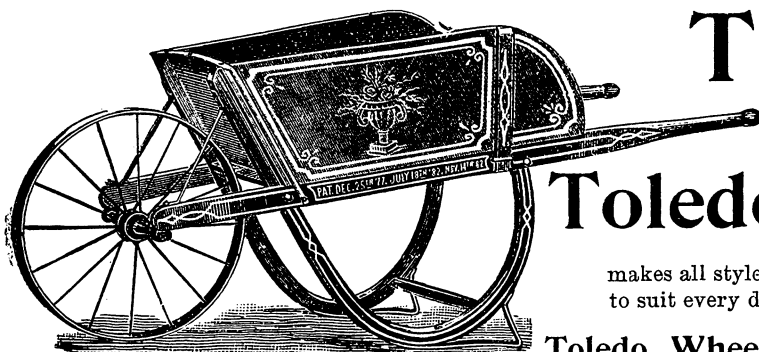
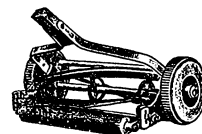
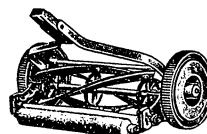


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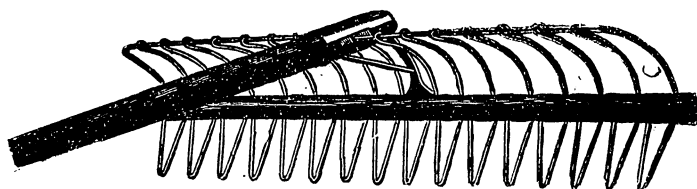
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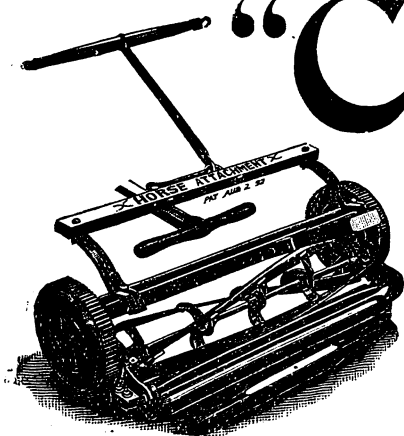
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With Horse Attachment.



TEN INCH TRACTION WHEEL. EXCELS FOR FINE QUALITY OF MATERIAL AND FINISH. SIMPLE ADJUSTMENTS, SMOOTH CUTTING.

THE ONLY FIRST-CLASS COMBINATION MOWER ON THE MARKET. PRICES LOW, TERMS REASONABLE.

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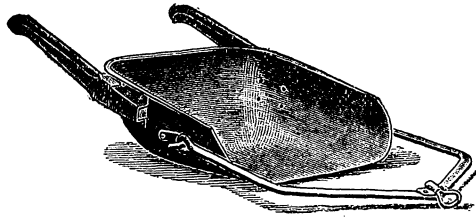
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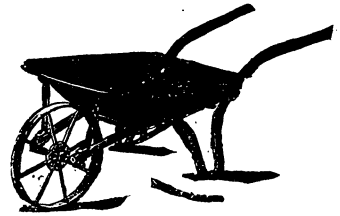
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May or may not suit the people at large ; but what we wanted to say was this : that if you want Wheelbarrows or Scrapers that there is no doubt about their suitable qualities, we are the people you want to address your orders to.



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BEST HIGH GRASS.

This is a strictly **High Grass Mower**, although it will cut short grass equal to a light Mower, and is very light draft, considering the weight.

The wheels are 10½ inches diameter, reel 8 inches diameter, and will cut grass 10 inches high.

The reel boxes are brass, and self-aligning ; every part of the Mower is easy of access to oil or adjust.

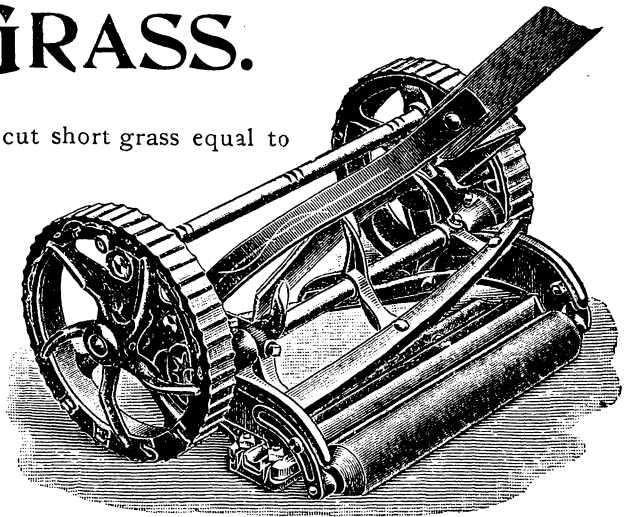
The connection is on the same principle as all others of our make, except 1½ shaft is used, instead of 5⁄8 shaft. This is a nice looking Mower.

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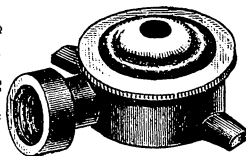


Japanese No. 12,
Adjust.

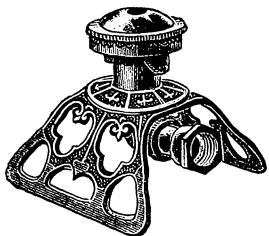
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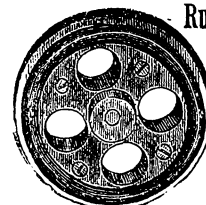
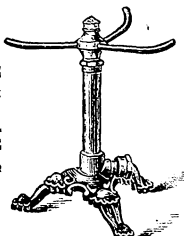
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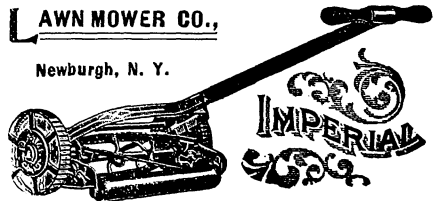
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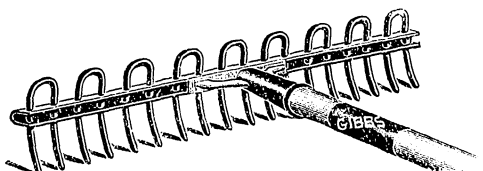


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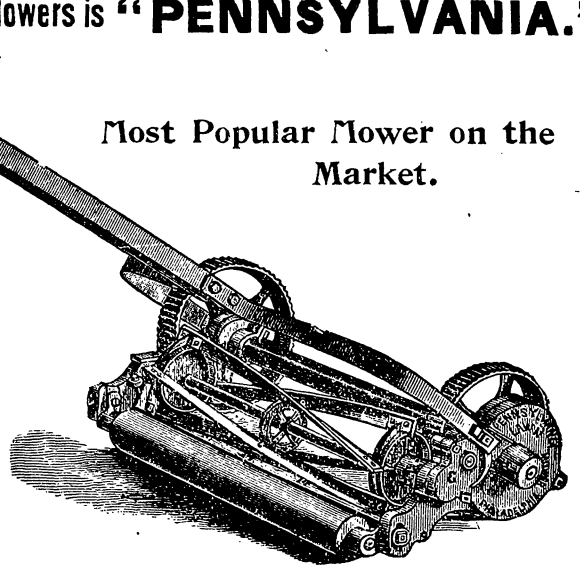
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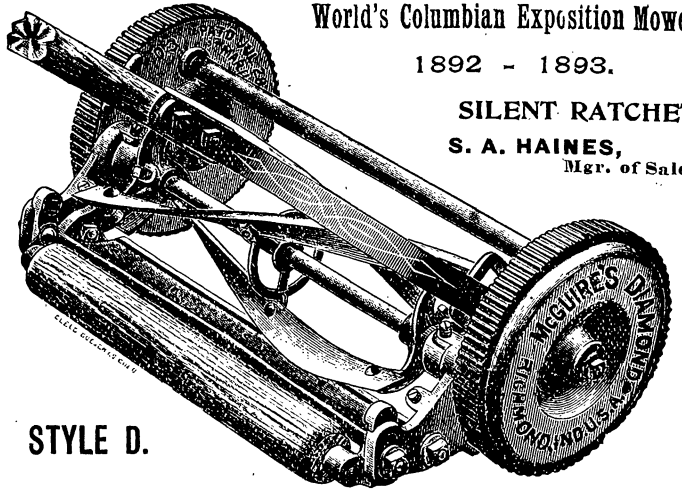
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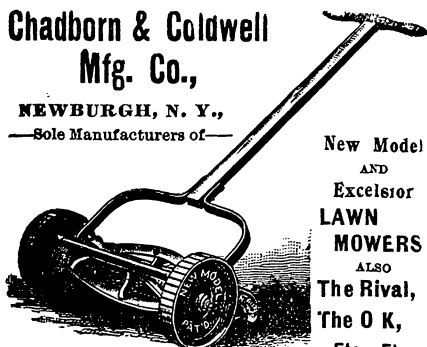
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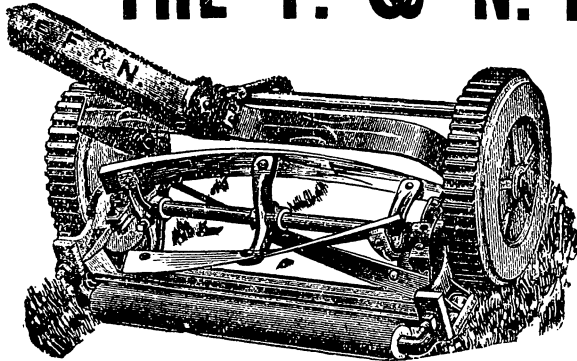
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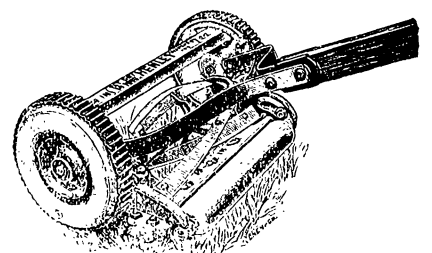
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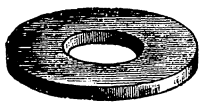
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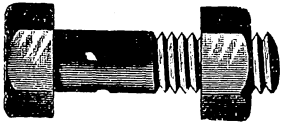
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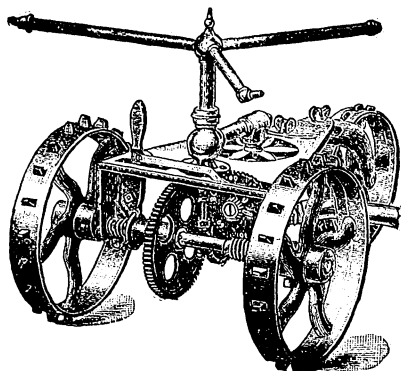
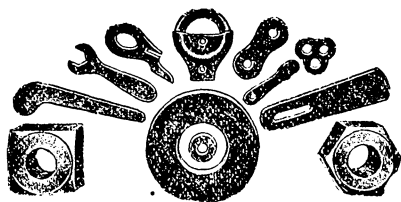
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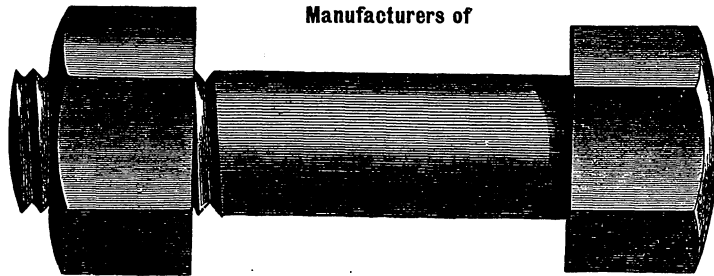
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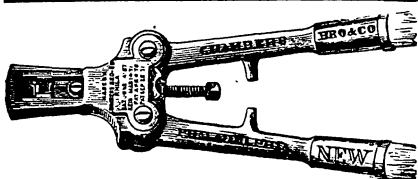
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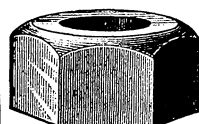
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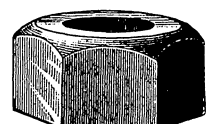
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Burgess & Loxley, Buffalo, N. Y.
Dayton Malleable Iron Co., Dayton, O.
Hammer & Co., Branford, Conn.
Woodruff, W. W. & Sons, Mt. Carmel, Conn.

Chains.
Bradlee & Co., Philadelphia.
Bridgeport Chain Co., Bridgeport, Conn.
Link-Belt Engineering Co., Phila., Pa.
McKay, Jas. & Co., Pittsburgh, Pa.

Chimneys.
Phila. Engineering Works., Phila., Pa.

Chisels, Manufacturers of.
Suck Bros., Millbury, Mass.
White, L. & I. J. Co., Buffalo, N. Y.

Chucks.
Cushman Chuck Co., Hartford, Conn.
Smith & Edge Mfg. Co., Bridgeport.
Union Mfg. Co., 103 Chambers, N. Y.
Whitton, D. E. Mach. Co., New London, Conn.

Clamps.
Hammer & Co., Branford, Conn.
Le Count, C. W., So. Norwalk, Conn.

Clipping Machines.
McCoy, Jos. F. & Co., 26 Warren St.

Coal.
Barns, O. K. & Co., Philadelphia, Pa.
Wister, Francis, Philadelphia, Pa.

Coffee and Spice Mills.
Sun Mfg. Co., Greenfield, O.

Coke.
Barns, C. K. & Co., Philadelphia, Pa.
Houston, O. B. & Co., Philadelphia, Pa.
Ralney, W. J., Cleveland, O.
Wister, Francis, Philadelphia, Pa.

Collections.
Hardware Board of Trade (Limited) 4 and 6 Warren, N. Y.

Condensers.
Worthington, Henry R., 86 & 88 Liberty Street, N. Y.

Conveying Machinery.
Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.
Jeffrey Mfg. Co., Columbus, O.
Link Belt Engineering Co., Phila., Pa.

Copper.
Ames Sword Co., Chicopee, Mass.
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
New Haven Copper Co., 284 Pearl N. Y.
Randolph & Clowes, Waterbury, Conn.
Wister, Francis, Philadelphia, Pa.

Coppersmiths.
Emory, P. P. Mfg. Co., Springfield, Mass.

Cordage.
Samson Cordage Works, Boston, Mass.

Cork Screws.
Williamson, C. T. Wire Novelty Co Newark, N. J.

Corrugated Furnaces.
Continental Iron Wks, Brooklyn, N. Y.

Corrugated Iron.
Cambridge Roofing Co., Cambridge, O.
Cincinnati Corrugating Co., Fiqua, O.
Moseley Iron Bridge & Roof Co., 5 Day N. Y.

Counting Machines.
Durant, W. N., Milwaukee, Wis.

Coupling.
Almond, T. R., Brooklyn, N. Y.

Coverings, Boiler and Pipe.
Johns, H. W. Mfg. Co., 37 Maiden Lane.

Cranes.
Detroit Foundry Equipment Co., Detroit, Mich.
Halsey, W. S. & Co., Birdsboro, Pa.
Harrington, E. Son & Co., Phila., Pa.
Maris & Beekley Philadelphia, Pa.
Ridgway, Craig & Sons, Coatesville, Pa.
Sellers, Wm. & Co., Inc., Phila., Pa.
Yale & Towne Mfg. Co., Stamford, Conn.

Cupolas, Hot-Blast.
Byram & Co., Detroit, Mich.
Colliau, Victor, Detroit, Mich.
Detroit Fdry. Equipment Co., Detroit, Mich.

Curling Irons.
Nicol & Co., Chicago, Ill.

Cutlery Cases.
Torrey, J. R. & Co., Worcester, Mass.

Cutlery, Importers of.
Field, Alfred & Co., 93 Chambers St., New York.
Gurney, Fred B., 116 Chambers St., N. Y.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Cutlery, Manufacturers of.
Bingham, W. Co., Cleveland, Ohio.
Clausen Shear Co., Fremont, O.
Dane, Stoddard & Kendall, Boston, Mass.
Electric Cutlery Co., 113 Chambers, N. Y.
Goodell Co., Antrim, N. H.
Northampton Cutlery Co., Northampton, Mass.
Wilson, John, Sheffield, England.

Dies.
Wilson, J. Fred, Worcester, Mass.

Die Forgings and Castings.
Bliss, E. W. Co., Brooklyn, N. Y.

Dog Collars.
Union Hardware Co., Torrington, Ct.

Door Checks and Springs.
Bardsley, J., 149 & 151 Baxter St., N. Y.
Corbin, P. & F., New Britain, Conn.

Drain Cleaners.
Buckeye Mfg. Co., Union City, Ind.

Drawing Instruments.
Keuffel & Esser Co., 127 Fulton St., N. Y.

Drilling Machines.
Bickford Drill & Tool Co., Cinn., Ohio.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower and Forge Co., Lancaster, Pa.
Colburn, A. M., New Haven, Conn.
Dallett, Thos. H. & Co., Philadelphia.
Dwight Slate Machine Co., Hartford, Conn.
Halsey, Jas. T., Philadelphia, Pa.
Hamilton Mch. Tool Co., Hamilton, O.
Herrick & Cowell, New Haven, Conn.
Norton & Jones Machine Tool Works, Plainville, Conn.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Quint, A. D., Hartford, Conn.
Sellers, Wm. & Co., Inc., Phila., Pa.
Stiles & Ware, So. Bend, Ind.
Sigourney Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.
Woodward & Rogers, Hartford, Conn.

Drop Forgings.
Becken Mch. Co., New Haven, Conn.
Billings & Spencer Co., Hartford, Conn.
Boone, W. C. Mfg. Co., Boonton, N. J.
Eccles, Richard, Auburn, N. Y.
Merrill Bros., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Ct.
Phila. Drop Forge Co., Philadelphia, Pa.
Scranton Forging Co., Scranton, Pa.
Spies, J. C. & Co., Worcester, Mass.
Williams, J. H. & Co., Brooklyn, N. Y.
Willmot & Hobbs Mfg. Co., Bridgeport, Conn.
Wyman & Gordon, Worcester, Mass.

Drop Presses.
Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Ferracute Mch. Co., Bridgeport, N. J.
Hamer & Peck Mfg. Co., New Haven, Conn.
Stiles & Parker Press Co., Brooklyn, N. Y.

See Alphabetical Index, Pages 105 & 106.

- Vulcan Iron Works, Chicago, Ill.**
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.
- Dumb Waiters.**
Storm Mfg. Co., Newark, N. J.
- Dust Beaters.**
Peabody & Parks, Troy, N. Y.
- Dynamite.**
New York Powder Co., 62 Liberty St., N. Y.
- Dynamos.**
C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
Zucker & Levett Chemical Co., 10 & 14 Grand St., N. Y.
- Edge Tools. Makers of.**
Suck Bros., Millbury, Mass.
Plumb, Fayette R., Philadelphia, Pa.
White, L. & J. Co., Buffalo, N. Y.
- Edging Shears.**
Dille & McGuire Mfg. Co., Richmond, Ind.
- Egg Beaters.**
North Bros. Mfg. Co., Philadelphia.
- Electric Bells and Supplies.**
Ostrander, W. R. & Co., 204 Fulton St., New York
Wollensak, J. F., Chicago, Ill.
- Electric Dynamo Machines.**
Colburn Electric Mfg. Co., Fitchburg, Mass.
Eddy Electric Mfg. Co., Windsor Conn.
Hanson & Van Winkle Co., Newark, N. J.
- Elevators. Makers of.**
Link-Belt Engineering Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.
- Emery and Emery Wheels.**
Bell, Geo. E., 36 John St., N. Y.
Grant Corundum Wheel Mfg. Co., Worcester, Mass.
N. Y. Beiting & Packing Co., Ltd., N. Y.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Sturtevant Mill Co., Boston, Mass.
- Emery Wheel Dressers.**
Bay State Stamping Co., Worcester, Mass.
- Enamels.**
Nubian Iron Enamel Co., Cragin, Ill.
- Engineers and Contractors.**
Aiken Henry, Pittsburgh, Pa.
Artificial Gas Engineering Co., Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
Lean, D. B. Co., Pittsburgh, Pa.
McClure, August & Co., Pittsburgh, Pa.
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.
Roberts, Frank C., Philadelphia, Pa.
Smaythe, S. R. Co., Incorporated Pittsburgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.
- Engines, Gas.**
Otto Gas Engine Works, Phila., Pa.
Rollason Gas Engine, Havemayer Bldg., N. Y.
- Engines, Steam. Makers of.**
Bass Foundry & Machine Works, Ft. Wayne, Ind.
Buckeye Engine Co., Salem, O.
Chandler & Taylor Co., Indianapolis, Ind.
Coulter & McKenzie Mch. Co., Bridgeport, Conn.
Erie Engine Works, Erie, Pa.
Lane & Bodley Co., Cincinnati, O.
Norwalk Iron Works Co., So. Norwalk, Conn.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Phila. Engineering Works, Phila., Pa.
Phoenix Iron Wks. Co., Meadville, Pa.
Southwest Foundry and Machine Co., Phila., Pa.
Tod, William & Co., Youngstown, O.
Wetherill, Robt. & Co., Chester, Pa.
- Exhaust Tumblers.**
Sweetser, W. A., Brockton, Mass.
- Expansion Bolts.**
Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.
Steward & Romaine Mfg. Co., Phila., Pa.
- Faucets, Self-Measuring.**
Lane Bros., Poughkeepsie, N. Y.
- Faucets, Wooden. Makers of.**
John Sommer's Son, Newark, N. J.
- Feed-Water Heaters.**
Davis, I. B. & Son, Hartford, Conn.
Goubert Mfg. Co., 32 Cortlandt St., N. Y.
Harrison Safety Boiler Wks. Phila., Pa.
National Pipe Bending Co., New Haven, Conn.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Webster, Warren & Co., Camden, N. J.
Whitlock Cold Pipe Co., Elmwood, Conn.
- Fencing, Iron and Wire.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York
Kilmer Mfg. Co., Newburgh, N. Y.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
- Files. Importers of.**
Moss, F. W., 80 John, N. Y.
- Files and Raps. Manufacturers of.**
Arcade File Works, Anderson, Ind.
Sinker & White, Troy, N. Y.
- Barnett, G. & H., 41 & 43 Richmond Phila.**
McCahey File Co., Philadelphia.
Nicholson File Co., Providence R. I.
- Fire Brick, Makers of.**
Horgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer B. & Sons, foot E. Houston, St. Louis
McLeod & Henry Co., Troy, N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro., Woodbridge, Mass.
- Fire Sets.**
Troy Nickel Works, Troy, N. Y.
- Fishing Tackle.**
Dams, Stoddard & Kendall, Boston, Mass.
- Flint and Emery Paper.**
Baeder, Adamson & Co., Phila., Pa.
- Flour Sifters.**
Meyers, F. J. Mfg. Co., Covington, Ky.
- Fine Cleaners.**
Mackey, Jas. T., St. Louis, Mo.
- Fodder Cutters.**
Silver Mfg. Co., Salem, O.
- Forges, Portable, &c.**
Bullock Bellows Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Empire Portable Forge Co., Lansingburgh, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Este & Henger Mfg. Co., St. Louis, Mo.
Gwinmer Mfg. Co., Hamilton, O.
Haines & Zimmerman, Phila., Pa.
Hart, H. C. Mfg. Co., Detroit, Mich.
Johnson, S. C., Racine, Wis.
Knapp & Cowles Mfg. Co., Bridgeport, Conn.
North Bros. Mfg. Co., Philadelphia, Pa.
Peabody & Parks, Troy, N. Y.
Weiland, Chas., 149 Chambers St., N. Y.
Wilson, J. Fred, Worcester, Mass.
- Forgings, Iron and Steel.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel—Cambria Iron Co., Johnstown, Pa.
Eastern Forge Co., Boston, Mass.
Frankford Steel Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
U. S. Projectile Co., Brooklyn, N. Y.
- Foundry Facings.**
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cin., O.
- Foundry Riddles.**
Estey, W. S., 65 Fulton, N. Y.
- Foundry Supplies.**
Colliat, Victor, Detroit, Mich.
Diamond Clamp & Flask Co., Richmond, Ind.
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cin., O.
- Friction Clutches.**
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.
- Friction Cone.**
Evans Friction Cone Co., Boston, Mass.
- Furnaces, Foundry.**
Byram & Co., Detroit, Mich.
- Gas Producers.**
Wood, R. D. & Co., Philadelphia, Pa.
- Gas & Steam Fitters' Supplies.**
Pancoast, Henry B. & Co., Phila., Pa.
- Gauge, Rolling Mill.**
Haines Gauge Co., Philadelphia, Pa.
- Gear Cutters.**
D. E. Whiton Mach. Co., New London, Conn.
- Gears.**
Boston Gear Works Boston, Mass.
Foote, Robt. & Son Co., Baltimore, Md.
U. S. Projectile Co., Brooklyn, N. Y.
- Glass Boards.**
Canton Saw Co., Canton, O.
- Glass Cutters.**
Monroe, S. G., Bristol, Conn.
- Glass Tubes.**
Ashcroft Mfg. Co., 111 Liberty St., N. Y.
- Glue.**
Baeder, Adamson & Co., Phila., Pa.
Kussia Cement Co., Gloucester, Mass.
- Grass Catchers.**
Supplee Hardware Co., Phila., Pa.
- Grinding and Polishing Machines.**
Herrick & Cowell, New Haven, Conn.
Norton Emery Wheel Co., Worcester, Mass.
- Grinding Mills.**
Foss Mfg. Co., Springfield, O.
- Grindstone Dressing Machinery.**
Blake & Johnson, Waterbury, Conn.
- Grindstones.**
Cleveland Stone Co., Cleveland, O.
- Gun Implements.**
Union Hdwr. Co., Torrington, Conn.
- Gunpowder, Makers of.**
Lubin & Sand Powder Co., 29 Murray St., N. Y.
- Hand Carts.**
Lansing Wheelbarrow Co., Lansing, Mich.
- Handles.**
New York Mallet and Handle Wks., 466 E. Houston St., N. Y.
- Haugers, Door.**
Chicago Spring Butt Co., Chicago, Ill.
Colburn Trolley Track Mfg. Co., Holyoke, Mass.
- Lane Bros., Poughkeepsie, N. Y.**
Victor Mfg. Co., Newburyport, Mass.
- Hardware Comm'n Merchants.**
Doecher, Martin, 88 Chambers, N. Y.
Field, Alfred & Co., 93 Chambers St., N. Y.
Graham, John H. & Co., 111 Chambers St., New York
Jacobus, W. H., 90 Chambers, N. Y.
- Hardware Manufacturers.**
Stearns, E. C. & Co., Syracuse, N. Y.
Union Mfg. Co., 109 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.
- Hardware Mfrs. Agents.**
Bincham, W. Co., Cleveland, O.
Clarke Thomas, St. John, New Brunswick.
Graham, John H. & Co., 113 Chambers, McCoy, Jos. F. Co., 26 Warren St., N. Y.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.
- Hardware Specialties.**
Ame Shear Co., Bridgeport, Conn.
Belden Machine Co., New Haven, Conn.
Berger Bros., Philadelphia, Pa.
Clark Mfg. Co., Buffalo, N. Y.
Empire Portable Forge Co., Lansingburgh, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Este & Henger Mfg. Co., St. Louis, Mo.
Gwinmer Mfg. Co., Hamilton, O.
Haines & Zimmerman, Phila., Pa.
Hart, H. C. Mfg. Co., Detroit, Mich.
Johnson, S. C., Racine, Wis.
Knapp & Cowles Mfg. Co., Bridgeport, Conn.
North Bros. Mfg. Co., Philadelphia, Pa.
Peabody & Parks, Troy, N. Y.
Weiland, Chas., 149 Chambers St., N. Y.
Wilson, J. Fred, Worcester, Mass.
- Harness Snaps.**
Covert Mfg. Co., West Troy, N. Y.
Coverts' Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.
- Hay Knives.**
Holt, Hiram, Co., E. Wilton, Me.
- Holisting Machines.**
Box, Alfred & Co., 314 Green, Phila.
Brown Holisting & Conveying Mch. Co., Cleveland, Ohio.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E. Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Liderwood Mfg. Co., 86 Liberty, N. Y.
Maris & Beekley, Philadelphia, O.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Spalding, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.
- Hollow Ware.**
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.
Stuart & Peterson Co., Phila., Pa.
- Hollow Ware, Aluminum.**
Illinois Pure Aluminum Co., Lemont, Ill.
- Horse Nails, Makers of.**
Capewell Horse Nail Co., Hartford, Conn.
National Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Neponset, Boston, Mass.
- Horse and Mule Shoes, Makers of.**
Bryden Horse Shoe Co., Catsanqua, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Diamond State Iron Co., Wilmington, Del.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Shoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.
- Hose.**
Cleveland Rubber Works, Cleveland, O.
N. Y. Beiting & Packing Co., Ltd., 16 Park Row, N. Y.
- Hydrants, &c.**
McLean, John, 296 & 298 Monroe, N. Y.
- Hydraulic Forging.**
U. S. Projectile Co., Brooklyn, N. Y.
- Hydraulic Jacks.**
Dudgeon, Richard, 24 Columbia, N. Y.
Watson & Stillman, 204 E. 43d, N. Y.
- Ice-Cream Freezers.**
Clement & Dunbar, Phila., Pa.
North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
White Mountain Freezer Co., Nashua, N. H.
- Injectors.**
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York
Sherwood Mfg. Co., Buffalo, N. Y.
- Insurance, Boiler.**
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.
- Iron and Steel, Swedish.**
Lundberg, Gustaf, Boston, Mass.
Milnc, A. & Co., 1 Broadway, N. Y.
- Iron Commission Brokers.**
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Barclay W. & Co., Phila.
Ething, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Lea, J. Tammall & Co., Philadelphia.
Pohr, J. J., 480 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Wister, L. & R. & Co., Phila., Pa.
- Iron Ore.**
Naylor & Co., 45 Wall, N. Y.
Samuel, Frank, Philadelphia, Pa.
- Iron, Merchants.**
Barnes, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Bussentius & Cunliffe, Philadelphia.
Corning Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia.
Cotton, Barclay W. & Co., Phila.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J. W., N. Y.
Navior & Co., 45 Wall St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 85 Elm St., N. Y.
Pierson & Co., 29 Broadway, N. Y.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, S. H. & Co., Philadelphia.
- Iron, Importers.**
Abbott Wheelock & Co., N. Y. and Boston
Lundberg, Gustaf, Boston, Mass.
- Iron, Sheet, Manufacturers of.**
Cambridge Iron & Steel Co., Cambridge Ohio
W. Dewees Wood Co., Lim., McKeesport, Pa.
- Ironwork, Ornamental.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
- Kettle Bottom.**
Diamond Hdwr. Co., Boston, Mass.
- Keys.**
Wollensak, J. F., Chicago, Ill.
- Ladders, Rolling.**
Colburn Trolley Track Mfg. Co., Holyoke, Mass.
- Ladies.**
Detroit Fdy. Equipment Co., Detroit, Mich.
- Lamp Stoves.**
Glazier Stove Co., Chelsea, Mich.
Plume & Atwood Mfg. Co., 18 Murray Street, New York.
- Lamps.**
Standard Lighting Co., Cleveland, O.
- Lanterns.**
Buhl Stamping Co., Detroit, Mich.
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Lathes.**
Draper Machine Tool Co., Worcester, Mass.
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Lathing, Wire.**
Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Laundry Machines.**
Johnson, S. C., Racine, Wis.
- Lawn Mowers.**
Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., Newburgh, N. Y.
Champion Mfg. Co., Richmond, Ind.
Colwell Lawn Mower Co., Newburgh, N. Y.
Dille & Anderson, Richmond, Ind.
Dille & McGuire Mfg. Co., Richmond, Ind.
Enterprise Mfg. Co., Philadelphia, Pa.
F. & N. Mfg. Co., Richmond, Ind.
Hensley, M. C., Richmond, Ind.
Mast, Foss & Co., Springfield, O.
Stearns, E. C. & Co., Syracuse, N. Y.
Supplee Hdwr. Co., Phila., Pa.
- Lawn Rakes.**
Gibbs Mfg. Co., Canton, Ohio.
Graham, Jno. H. & Co., 113 Chambers St., N. Y.
Konler, F. E. & Co., Canton, O.
Schaeffer & Co., Dayton, Ohio.
- Lawn Sprinklers.**
Este & Henger Mfg. Co., St. Louis.
Gibbs Mfg. Co., Canton, Ohio.
McGowan, John H. Co., Cincinnati O.
Portland Lawn Sprinkler Co., Portland, Me.
- Leather Parts.**
Greene, J. Frank, 278 Water St. New York.
- Lemon Squeezers.**
Ripley Mfg. Co., Unionville, Conn.
- Letters and Figures, Metallic.**
White, A. A. & Co., Providence, R. I.
- Letters, Paper.**
Tablet & Ticket Co., Chicago, Ill.
- Levels.**
Davis & Cook, Watertown, N. Y.
Richardson, O. F., & Son Athol, Mass.
- Locks & Knobs, Manufacturers of.**
Deltz, A. E., 97 Chambers, N. Y.
Keyless Lock Co., Chicago, Ill.
Reading Hdwr. Co., Reading, Pa.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Yale & Towne Mfg. Co., Stamford, Conn.

Machinery.

En. Tool Works, Cleveland, Ohio.
Barnes, W. F. & John, Rockford, Ill.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 45 Day, N. Y.
Bignall & Keeler Mfg. Co., St. Louis.
Birmingham Iron Foundry, Birmingham, Conn.

Bless, E. W. Co., Brooklyn, N. Y.
Bogert, Jno. L., Flushing, N. Y.
Briggs, Marvin, 12 Broadway, N. Y.
Carlin's Sons, Thos., Allegheny, Pa.
Cinn. Milling Mch. Co., Cincinnati, Ohio.

Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
Coulter & McKenize Mch. Co., Bridgeport, Conn.
Detrick & Harvey Mch. Co., Baltimore, Md.

Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Laight & Canal Sts.
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.

Harrington, E. Son & Co., Phila. Pa.
Henderer, A. L., Wilmington, Del.
Hender Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.

Howard & Morse, 45 Fulton St., N. Y.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt.
Lovegrove & Co., Philadelphia, Pa.

McCabe, J. J., 68 Cortlandt, N. Y.
Machinery Supply Co., Rochester, N. Y.
Manville, E. J. Mch. Co., Waterbury, Conn.

National Machinery Co., Tiffin, Ohio.
Newark Mch. Tool Works, Newark, N. J.
New Haven Mfg. Co., New Haven, Conn.
Niles Tool Wks., 138 Liberty St., N. Y.

Pittsburgh Mfg. Co., Pittsburgh, Pa.
Place, Geo., 120 Broadway, N. Y.
Poele, Robt. & Son Co., Baltimore, Md.
Powell Planer Co., Worcester, Mass.

Pratt & Whitney Co., Hartford, Conn.
Prentiss Tool & Supply Co., N. Y.
Scranton Supply & Mchry. Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.

Seyfert's Sons L. F., Philadelphia, Pa.
Steppe, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., Ltd., Phila.
Toomey, Frank, Philadelphia, Pa.

Wetherill, Robert & Co., Chester, Pa.
Wickes Bros., Saginaw, Mich.
Wilson, W. A., Rochester, N. Y.

Machinery for Hardware Manufacture.

Adt, Jno. & Son, New Haven, Conn.

Machine Knives.

Coring Coes & Co., Worcester, Mass.
Loyd, John, 558-562 Water St., N. Y.

Machine Tools.—See Machinery.**Machine Work.**

Papping, J., 58th St., & 11th Ave., N. Y. City.

Machinists' Scales.

Coffin & Leighton, Syracuse, N. Y.
Starrett, L. S., Athol, Mass.
Valentine Tool Co., Hartford, Conn.

Machinists' Tools and Supplies.

King, J. M. & Co., Waterford, N. Y.
Sellers, Wm. & Co., Inc., Phila.

Mallets.

N. Y. Mallet & Handle Works, N. Y.

Mangles.

Johnson, S. C., Racine, Wis.

Manufacturing Sites.

Illinois Central R. R., Chicago, Ill.

Measuring Tapes.

Keuffel & Esser Co., 127 Fulton St., N. Y.
Lufkin Rule Co., Saginaw, Mich.

Mechanical Instruction.

Correspondence School of Mechanics
Scranton, Pa.

Metals.

Fearing, Wm. S., 100 Chambers, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
Naylor & Co., 45 Wall, N. Y.

Metal Brokers.

American Metal Co., N. Y.

Metallurgists.

Britton J. Blodgett, Phil

Milling Machines.

Cin. Milling Mch. Co., Cincinnati, Ohio.

Mining Knives.

Palmer Hdw. Mfg. Co., Troy, N. Y.

Mine Lamps.

Darby, Edw. & Sons Phila. Pa.
Leonard, B. E., Scranton, Pa.

Mining Screens.

Harrington & King Perforating Co.
Chicago, Ill.

Models, Makers of.

Franklin, H. H. Mfg. Co., Syracuse, N. Y.
Ideal Machine Works, Hartford, Conn.

Molding Sand.

Obermayer, S. Co., Cincinnati, O.

Money Drawers.

Sun Mfg. Co., Greenfield, O.

Motors, Water and Electric.

C. & C. Electric Co., 402 and 404
Greenwich St., N. Y.
Dallett, Thos. H. & Co., Phila. Pa.

Roll Machinery.

Pittsburgh Mfg. Co., Pittsburgh, Pa.

Nails (Cut) and Spikes.

Borden & Lovell, 70 West, N. Y.
Cumberland Nail & Iron Co., Phila.

Oxford Iron Co., 81 Washington,
Pottstown Iron Co., Pottstown, Pa.
Riverside Iron Wks., Wheeling, W. Va.
Valley Steel Co., St. Louis, Mo.

Nickel Platers' Supplies.

Colburn Electric Mfg. Co., Fitchburg, Mass.
Eddy Electric Mfg. Co., Windsor, Conn.
Janson & Van Winkle Co., Newark, N. J.
Zucker & Levett Chemical Company,
10 to 14 Grand St., N. Y.

Novelty Shapes, Rollers of.

Rosland, William & Harvey, Frankford, Philadelphia

Novelty Manufacturers.

Franklin, H. H. Mfg., Syracuse, N. Y.
Ideal Machine Works, Hartford, Conn.

Nut Machines.

Junham Nut Mch. Co., Unionville, Ct.

Nuts, Bolts, & Co., Makers of.

American Bolt Co., Lowell, Mass.
American Screw Co., Providence, R. I.

Blake & Johnson, Waterbury, Conn.
Eastern Forge Co., Boston, Mass.
Cassell, Wm. H. Co., Pawtucket, R. I.

Mt. Carmel Bolt Co., Mt. Carmel, Conn.
Pennsylvania Bolt & Nut Co., Lebanon, Pa.

Port Chester Bolt and Nut Co., Port Chester, N. Y.

Russell, Burdall & Ward, Port Chester

Sternberg, J. B. & Son, Reading, Pa.
Wilson, J. Fred., Worcester, Mass.
Wm. H. Haskell Co., Pawtucket, R. I.

Oil Cups and Lubricators.

Sherwood Mfg. Co., Buffalo, N. Y.

Oilers.

Wilnot & Hobbs Mfg. Co., Bridgeport, Conn.

Oil Stones.

Pike Mfg. Co., Pike Station, N. H.

Oil Stoves.

Glazier Stove Co., Chelsea, Mich.
Ohio Crude Petroleum Oil Stove Co.,
Ironton, O.

Ores.

Wister, Francis, Philadelphia, Pa.

Box Shears.

Scranton Forging Co., Scranton, Pa.

Packing.

Morrison, Robt., St. Louis, Mo.
N. Y. Belting & Packing Co. Ltd., N. Y.

Paddocks.

Ames Sword Co., Chicopee, Mass.
Fram, E. T., Lancaster, Pa.
Hillebrand & Wolf, Phila. Pa.

Paint.

Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.

Paint Burners.

Dangler Stove & Mfg. Co., Cleveland, O.

Paint Cans.

Wilnot & Hobbs Mfg. Co., Bridgeport, Conn.

Pants Stretcher.

Covert Mfg. Co., West Troy, N. Y.

Patent Solicitors.

Howson & Howson, Phila. & Wash'ton.
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

Perforated Metal.

Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co.,
Chicago, Ill.

Hendrick Mfg. Co., Ltd., Carbondale, Pa.

Phosphor Bronze.

Phosphor Bronze Smelting Co., Limited,
512 Arch, Philadelphia.

Phosphor Tin.

Orescoat Phosphorized Metal Co.,
Philadelphia, Pa.

Rail & Naumann.

516 Pearl, N. Y.

Flasks and Mallets.

Flumo, Fayette K., Philadelphia, Pa.

Fig Iron.

Doustan, C. B. & Co., Philadelphia, Pa.
Montour Iron & Steel Co., Danville, Pa.

Naylor & Co., 45 Wall, N. Y.
Pilling & Crane, Philadelphia, Pa.
Samuel, Frank, Philadelphia, Pa.

Fig Iron Storage.

Am. Pig Iron Storage Warehouse Co., 44
Wall, N. Y.

File Drivers.

Vulcan Iron Wks., Chicago, Ill.

File Bent.

National Pipe Bending Co., New Haven

Pipe Cutting and Threading Machines.
Signal & Keeler Mfg. Co., St. Louis, Mo.
Merrill Mfg. Co., Toledo, O.
Fancoast Henry B. & Co., Philadelphia.
Saunders Sons, D., Yonkers, N. Y.

Pipe Grips.

Prentiss Vise Co., 44 Barclay, N. Y.

Pipes, Fittings, & Co., Makers of.

McNab & Hardin Mfg. Co., N. Y.

Pipe, Water and Gas, Makers of.

Cumberland Nail & Iron Co., Phila. Pa.
Donaldson Iron Co., Emmaus, Pa.
Riverside Iron Works, Wheeling, W. Va.
Wood, R. D. & Co., Philadelphia, Pa.

Plane Irons, Manufacturers of.

Suck Bros., Millbury, Mass.

Planes, Manufacturers of.

Stanley Rule & Level Co., N. Y.

Plated Ware.

Bozeman, L. & Son, New Fadder Ct.
Holmes & Edwards Silver Co., Bridgeport, Conn.

Rogers, Wm. Mfg. Co., Hartford, Ct.

Plate, Iron and Steel, Mfgs of.

Etna-Standard Iron & Steel Co.,
Bridgeport, O.
Lukens Iron & Steel Co., Coatesville, Pa.

Mahoning Valley Iron Co., Youngstown, Ohio.

McLean Co., Pittsburgh, Pa.
McLain & Sons, Reading, Pa.
Pottstown Iron Co., Pottstown, Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.

Singer, Nimick & Co., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.

Vellman Iron & Steel Co., Thurlow, Pa.
Wood Alan Co., Philadelphia.

Plating, Nickel, Brass and Silver.

Wilnot & Hobbs Mfg. Co., Bridgeport, Conn.

Pokers and Lifters.

Troy Nickel Works, Troy, N. Y.

Polishing Machines.

Watson & Stillman, 204 E. 43d, N. Y.

Post Hole Diggers.

Buckeye Mfg. Co., Union City, Ind.
Gibbs Mfg. Co., Canton, Ohio.
Wister, L. & R., Co., Philadelphia, Pa.

Poultry Nettings.

Barnum, E. T., Detroit, Mich.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.

N. J. Wire Cloth Co., Trenton, N. J.
Tyler Wire Wks. Co., W. S., Cleveland, O.

Wright & Colton Wire Cloth Co.,
Worcester, Mass.

Power.

Lafin & Rand Powder Co., 29 Murray
New York Powder Co., 62 Liberty St.,
N. Y.

Power Hack Saws.

Millers Falls Co., 93 Reade St., N. Y.

Power Hammers.

Selden Mach. Co., New Haven, Conn.
Dienet & Eisenhardt, Philadelphia.

Dupont Mfg. Co., St. Johnsbury, Vt.
Jenkins & Lingie, Bellefonte, Pa.

Presses, Dies, & Co.

E. W. Bliss Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.

Ferracute Mch. Co., Bridgeton, N. J.
Stark Mch. & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Waterbury Mch. Co., Waterbury, Conn.

Presses, Power, Makers of.

Bliss, E. W. Co., Brooklyn, N. Y.
Manville, E. J. Mch. Co., Waterbury, Ct.

Stark Mch. & Tool Co., Buffalo, N. Y.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Pulleys.

Keystone Clutch Mch. Wks., Phila., Pa.

Lake, J. H. & D. Co., Massillon, Ohio.
Reeves Pulley Co., Columbus, Ind.

Pulley Fixings.

Foley, J. W. & Co., Cincinnati, O.

Pumping Machinery.

Dean Bros. Steam Pump Works, Indianapolis, Ind.

Lutens, C. O. & Co., Greenvale, Ohio.
McGowan, J. H. & Co., Cincinnati, O.

Maslin, J. & Son, Jersey City, N. J.
Norwalk Iron Wks. Co., So. Norwalk, Conn.

Southark Fdy. & Mch. Co., Phila. Pa.
Valley Pump Works, Bathampton Mass.

Worthington, Henry R., 86 & 88 Liberty St., N. Y.

Pumps, Makers of.

Bellevue Pump Co., Bellevue, Iowa.
Deming Co., Salem.

Douglas, W. B., Middletown, Conn.
Mass. Foot & Co., Springfield, O.
Myers, F. E. & Bro., Ashland, O.

Punches and Shears, Hand and Power.

E. W. Bliss Co., Brooklyn, N. Y.
Cockburn Barrow & Mch. Co., Jersey City, N. J.

Crosby, G. A. & Co., Chicago, Ill.
Ferracute Mch. Co., Bridgeton, N. J.

Henderer, A. L., Wilmington, Del.
Stark Mch. & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.

Watson & Stillman, 204 E. 43d, N. Y.

Rails, Old and New.

Perry, W. H. & Co., Providence, R. I.

Rat and Mouse Traps.

Burditt & Williams, Boston, Mass.
Estey, W. S., 65 Fulton, N. Y.

Ripley Mfg. Co., Unionville, Conn.
Sun Mfg. Co., Greenfield, O.

Razors.

Electric Cutlery Co., 113 Chambers, N. Y.
J. R. Torrey Razor Co., Worcester, Mass.

Reels.

Hendry, A. B. Co., New Haven, Conn.

Refrigerator Door Fasteners.

Conroy, F. J. & Co., Philadelphia.

Refrigerators.

Challenge Corn Planter Co., Grand Haven, Mich.

Monroe Refrigerator Co., Lockland, O.

Rivets.

Blake & Johnson, Waterbury, Conn.
Boyce Rivet Co., Muncie, Ind.

Burden Iron Co., Troy, N. Y.
Cobb & Drew, Plymouth, Mass.

New England Screw Co., Boston, Mass.
Sternberg, J. B. & Son, Reading, Pa.
Pownsend, W. P. & Co., New Brighton

Riveting Machines.

Adt, Jno. & Sons, New Haven, Conn.

Rock Drills.

Rand Drill Co., 23 Park Place, N. Y.

Rolling Mill Machinery.

Birmingham Iron F'dry, Birmingham, Conn.
Booth, The Lloyd, Co., Youngstown, O.
Leachburg Foundry & Mch. Co., Pittsburgh, Pa.
Mahoning F'dry & Mch. Co., Danville, Pa.

Morgan Construction Co., Worcester, Mass.

Robinson-Rea Mfg. Co., Pittsburgh.

Totten & Hogg Iron and Steel F'dry Co.,
Pittsburgh, Pa.

Trethewey Mfg. Co., Pittsburgh, Pa.
Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.

Roll Lathes.

Totten & Hogg Iron & Steel F'dry Co.,
Pittsburgh, Pa.

Rolls, Chilled, Sand and Steel.

Booth, The Lloyd, Co., Youngstown, O.
Garrison, A. F'dry Co., Pittsburgh, Pa.

Seaman, Sleeth & Black, Pittsburgh.

Totten & Hogg Iron and Steel F'dry Co.,
Pittsburgh, Pa.

Roofing.

Berlin Iron Bridge Co., E. Berlin, Conn.

Boston Bridge Works, Boston, Mass.
Cambridge Roofing Co., Cambridge, O.

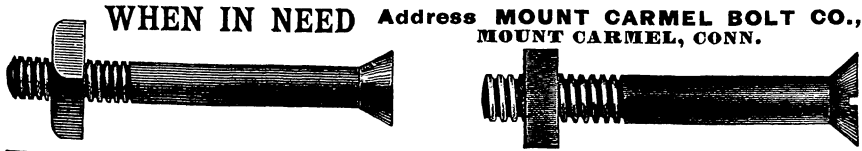
Cincinnati Corrugating Co., C. O.
Johns, H. W. Mfg. Co., 37 Mald

- Allentown Rolling Mill.** Allentown, Pa.
Lockhart Iron & Steel Co., Pittsburg, Pa.
Passaic Rolling Mill Co., Paterson, N. J.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phoenix Iron Co., Phila., Pa.
- Shears and Scissors.**
Acme Shear Co., Bridgeport, Conn.
Edwards, R. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**
Etina-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Oress Bros., Pittsburg, Pa.
Mahoning Valley Iron Co., Livingston, Ohio.
Moorehead-McCleane Co., Pittsburg, Pa.
Piereson & Co., 29 Broadway, N. Y.
Singer, Nimick & Co., Ltd., Pittsburg, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Metal Work.**
Clark & Cowles, Plainville, Conn.
- Sheet Zinc.**
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.**
Koch, A. B. & Co., Peoria, Ill.
- Sinks.**
Douglas, W. & B., Middletown, Conn.
- Skates, Ice.**
Dams, Stoddard & Kendall, Boston, Mass.
Lovell, Jno. P. Arms Co., Boston, Mass.
Stegels, Sweet & Lyon, 35 Barclay St., N. Y.
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**
Henley, M. C., Richmond, Ind.
Union Hardware Co., Torrington, Conn.
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.
- Smelting Works.**
Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**
Clendenin Bros., Baltimore, Md.
Covert Mfg. Co., West Troy, N. Y.
- Speaking Tubes.**
Ostrander, W. R. & Co., 204 Fulton St., N. Y.
Wollensak, J. F., Chicago, Ill.
- Specialties, Pat. Articles.**
Konigsloew, O., Cleveland, O.
Rhodes, L. E. Co., Hartford, Conn.
- Spelter.**
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Spoons and Forks.**
Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Bogers, The Wm. Mfg. Co., Hartford, Conn.
- Sporting Goods.**
Hartley & Graham, 818-815 B'way, N. Y.
- Spring.**
Cary, Alanson, 240-242 W. 29th St., N. Y.
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Roland, Wm. & Harvey, Phila., Pa.
Sabin Machine Co., Montpelier, Vt.
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolfe, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
- Spring Hinges.**
Chicago Spring Butt Co., Chicago, Ill.
Fullman Sash Balance Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Co., 14 Warren St., N. Y.
- Stamped Ware.**
Am. Stamping Co., 104 & 106 John St., New York.
- Stamping Works.**
Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.**
Cobb & Drew, Plymouth, Mass.
Titchener E. H. & Co., Binghamton, N. Y.
- Steam Gauges.**
Ashcroft Mfg. Co., 111 Liberty St., N. Y.
Bristol Mfg. Co., Waterbury, Conn.
- Steam Hammers, &c., Makers of.**
Dienelt & Eisenhardt, Philadelphia.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Trethewey Mfg. Co., Pittsburg, Pa.
- Steam Heating.**
Webster Warren & Co., Camden, N. J.
- Steam Separators.**
Gouvert Mfg. Co., 32 Cortland St. N. Y.
Harrison Safety Boiler Wks., Phila. Pa.
- Steel, Cold Rolled Strip.**
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel Figures and Alphabets.**
Hoeft, C. W., 52 Fulton St., N. Y.
Jones, W., 61 Fulton St., N. Y.
Wolfe, C. H., 177 William St., N. Y.
- Steel Importers.**
Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 91 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 85 John, N. Y.
Whitwell Bros., 93 Liberty St., N. Y.
Whitney, A. B. & Co., B'way, N. Y.
Wolfe, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Steel (Mushet's Special).**
Jones, B. M. & Co., Boston.
- Steel Manufacturers.**
Etina-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.
Baker, Herman & Co., 103 Duane St. Carbon Steel Co., Pittsburg, Pa.
Chester Steel Castings Co., Pa.
Chromsteel Works, Brooklyn, N. Y.
Creuscent Steel Co., Pittsburg, Pa.
Eiken & Co., Hagen, Germany.
Frankford Steel Co., Philadelphia.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 91 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Kayser, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburg, Pa.
Lukens Iron & Steel Co., Coakville, Pa.
Moorehead-McCleane Co., Pittsburg, Pa.
Moss, F. W., 83 John, N. Y.
Naylor & Co., 45 Wall, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Rowland, Wm. & Harvey, Frankford, Philadelphia.
Singer, Nimick & Co., Pittsburg, Pa.
Stanley Works, New Britain, Conn.
Steel & Iron Improvement Co., Pittsburg, Pa.
Taylor Iron & Steel Co., High Bridge, N. J.
Valley Steel Co., St. Louis, Mo.
Wordlaw S. & C., Sheffield, Eng.
Whitwell Bros., 93 Liberty, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel, Manufacturers' Agents.**
Barnes, C. K. & Co., Philadelphia, Pa.
Corning, Edw. & Co., B'way, N. Y.
Frasse Co., 19 Warren St., New York.
Lindsay, Jas. G. & Co., Phila., Pa.
Piereson & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.
- Steel, Tool.**
Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburg, Pa.
- Step Ladders.**
Bicycle Step Ladder Co., Chicago, Ill.
Croissant, M., Albany, N. Y.
- Stocks and Dies.**
Armstrong Mfg. Co., Bridgeport, Conn.
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Baunders Sons, D., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Stove Linings.**
Ostrander Fire Brick Co., Troy, N. Y.
- Stove Pipe Thimbles.**
Cheney, S. & Son Manlius, N. Y.
- Stove Trimmings.**
Troy Nickel Works, Troy, N. Y.
- Stove Trucks.**
Gwinner Mfg. Co., Hamilton, O.
- Street Lamps.**
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Strops.**
Electric Cutlery Co., 113 Chambers, N. Y.
J. R. Torrey & Co., Worcester, Mass.
- Structural Iron Work.**
Berlin Iron Bridge Co., East Berlin, Conn.
Boston Bridge Wks., Boston, Mass.
Lindsay, Jas. G. & Co., Phila., Pa.
Wrought Iron Bridge Co., Canton, O.
- Sulphuric Acid.**
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Tacks, Brads, Staples, &c.**
Atlas Tack Corporation, Boston, Mass.
Clendenin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
- Taps and Dies.**
Futterfield & Co., Derby Line, Vt.
Carpenter, M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.**
Rieble Bros. Testing Mch. Co., Philadelphia.
- Testing Machines.**
Rieble Bros. Testing Mch. Co., Phila.
- Theatrical Hardware.**
Wollensak, J. F., Chicago, Ill.
- Thill Springs.**
Frost Thill Spring Co., Boston, Mass.
Sabin Machine Co., Montpelier, Vt.
- Timber and Mineral Land.**
Robertson, E. Co., Cincinnati, O.
- Time Record.**
Scattergood, H. W., Phila., Pa.
- Tin Plate Machinery.**
Lloyd Booth Co., Youngtown, Ohio.
- Tinware.**
Am. Stamping Co., 104 & 106 John St., New York.
- Tire Upsetters.**
Butts & Ordway, Boston, Mass.
- Toe Calks, Steel.**
Burke, P. F., Boston, Mass.
- Tool Chests.**
Am. Tool Co., 200 W. Houston St., N. Y.
- Tools.**
Britton, Horace E., Stoughton, Mass.
Brown, R. H. & Co., New Haven, Conn.
Frasse Co., 19 Warren St., New York.
Mayhew, H. H. Co., Shelburne Falls, Mass.
Millers Falls Co., 98 Reade, N. Y.
Nicol & Co., Chicago, Ill.
Richardson, C. F. & Son, Athol, Mass.
Stanley Rule & Level Co., 29 Chambers, Starrett, L. S. Athol, Mass.
Tower & Lyon, 95 Chambers St., N. Y.
Wilkinson, A. J. & Co., Boston, Mass.
- Tools, Blacksmith and Wheelwrights.**
Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Fiumb, Fayette R., Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Tools, Steam and Gas Fitters'.**
Saunders' Sons, D., Yonkers, N. Y.
- Torches, Oil and Gasolene.**
Dangler Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
- Transom Lifters.**
Wollensak, J. F., Chicago, Ill.
- Trucks, Manufacturers of.**
Clark, G. P., Windsor Locks, Conn.
Lansing Wheelbarrow Co., Lansing, Mich.
- Tubes, Seamless Drawn Copper.**
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.
- Tubes, Steel.**
Ellwood Shafting & Tube Co., Ellwood City, Pa.
Leng's John S. Son & Co., 4 Fletcher St., New York.
Shelby Steel Tube Co., Shelby, O.
U. S. Projectile Co., Brooklyn, N. Y.
- Tumbling Barrels.**
Henderson Bros., Waterbury, Conn.
- Turnbuckles.**
Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.
- Twist Drills, Makers of.**
Cleveland Twist Drill Co., Cleveland.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.
- Valves, Gas, Water and Steam.**
Best, Fox & Co., Pittsburg, Pa.
Chapman Valve Mfg. Co., Boston.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., 71 John, N. Y.
Lunkenheimer Co., Cincinnati, O.
McNab & Harlin Mfg. Co., 56 John, N. Y.
Mason Regulator Co., Boston, Mass.
- Ventilating Fans.**
Huyett & Smith Mfg. Co., Detroit, Mich.
- Ventilator Appliances.**
Howard & Morse, 45 Fulton, N. Y.
- Vise Jaws.**
Newark Mch. Tool Co., Newark, N. J.
- Vises.**
Athol Machine Co., Athol, Mass.
Capital Mch. Tool Co., Auburn, N. Y.
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Millers Falls Co., 98 Reade St., N. Y.
Prentiss Vise Co., 44 Barclay St., N. Y.
Tower & Lyon, 95 Chambers St., N. Y.
Van Wagoner & Williams Co., 14 Warren St., N. Y.
- Wagon Jacks.**
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.
- Washers.**
Haskell, Wm. H. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Sternbergh, J. H. & Son, Reading, Pa.
- Washing Machines.**
Richmond Cedar Works, Richmond, Va.
- Water Meters.**
Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Water Wheels.**
Poole, Robt. & Son Co., Baltimore, Md.
- Wheelbarrows.**
Amer. Steel Scraper Co., Sidney, Ohio.
Cockburn Barrow & Mch. Co., Jersey City, N. J.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Lansing Wheelbarrow Co., Lansing, Mich.
Sidney Steel Scraper Co., Sidney, O.
Toledo Wheelbarrow Works, Toledo, Ohio.
- Window Cord, Makers of.**
Samson Cordage Works, Boston, Mass.
- Wire, Manufacturers of.**
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Salem Wire Nail Co., Salem, O.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester, Mass.
Wetherell Bros., 93 Liberty St., N. Y.
Wolfe, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**
Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
Estey, W. B., 65 Fulton, N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff, N. Y.
Howard & Morse, 45 Fulton, N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleveland.
- Wire Cutters.**
Higginum Hdw. Co., Higginum, Conn.
King, J. M. & Co., Watertown, N. Y.
- Wire Dies.**
McFarland, Wm., Trenton, N. J.
Newton & Shipman, 83 John, N. Y.
- Wire Fences.—See Fencing, Iron and Wire.**
- Wire Goods, Manufacturers of.**
Darby, Edward & Sons, Phila.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
Ludlow-Saylor Wire Co., St. Louis.
Ossawan Mills Co., Norwalk, Conn.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Williamson, C. T. Wire Novelty Co., Newark, N. J.
- Wire Machinery.**
Am. Tool Wks., Cleveland, O.
Manville W. Mch. Co., Waterbury, Conn.
Morgan Construction Co., Worcester, Mass.
Waterbury Mch. Co., Waterbury, Conn.
- Wire Straightening and Outline Machinery.**
Adt, John & Son, New Haven, Conn.
- Wire Nails.**
Bond Nail Co., Raynham, Mass.
Indiana Wire Fence Co., Crawfordsville, Ind.
Kilmer Mfg. Co., Newburg, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
Phillips, Townsend & Co., Phila., Pa.
Salem Wire Nail Co., Salem, O.
Whitney, A. B. & Co., New York City.
- Wire Rods, Steel.**
New Castle Wire Nail Co., New Castle, Pa.
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Wolfe, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
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California Wire Works, San Francisco
Hazard Mfg. Co., Wilkesbarre, Pa.
A. Leschen & Sons Rope Co., St. Louis.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester, Mass.
Williamsport Wire Rope Co., Williamsport, Pa.
- Wood-Working Machinery.**
Fay, J. A. & Egan Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
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Cox Wrench Co., Worcester, Mass.
Tower & Lyon, 95 Chambers St., N. Y.
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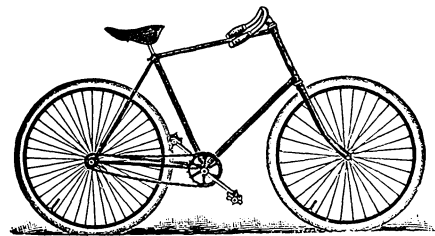
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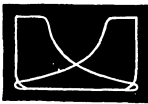


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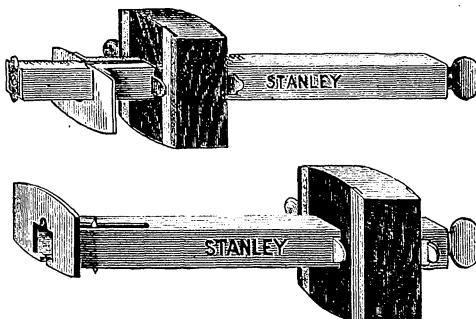
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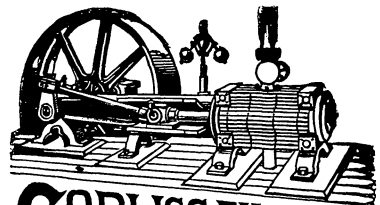
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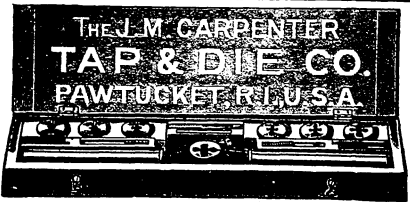
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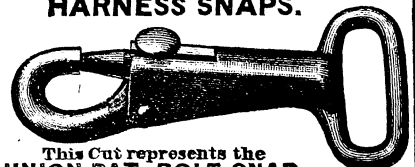
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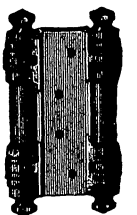
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THE IRON AGE

THURSDAY, JANUARY 18, 1894.

Hydraulic Power Supply in London.

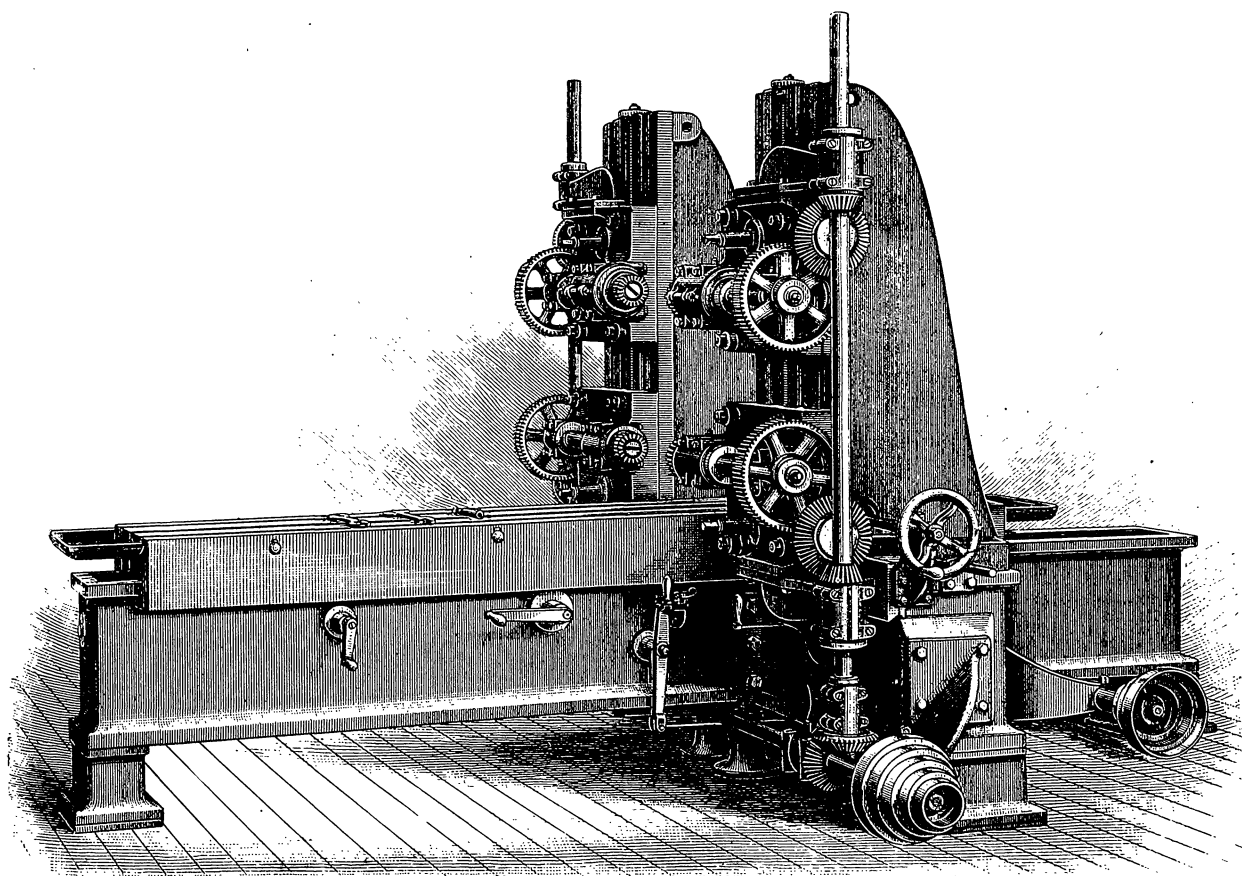
[F]rom a paper read by E. B. Ellington at a recent meeting of the Institution of Civil Engineers we learn that in December, 1887, there were 609 machines worked by water from the system in London, and in December, 1892, there were 1755. The length of mains had increased from 27 to 58 miles, and the available horsepower from 800 to 2600. There are now four pumping stations in service. The author furnished particulars of the actual cost of the supply of hydraulic energy for the years 1884 to 1892 under

period, and further development was unlikely to exercise any material influence on the cost. The influence of capital expenditure on plant in relation to output was as important as the actual expense in determining the cost at which the consumer could obtain energy. The capital outlay for hydraulic supply in London had fallen from £2.8 per 1000 gallons in 1885 to £1.24 in 1892, and a further reduction was anticipated in the future.

In conclusion, reference was made to the value of the high pressure supply for purposes of fire extinction. Attention was also directed to the value of

Four-Spindle Milling Machine.

The Pratt & Whitney Company designed for the J. L. Mott Iron Works of New York the machine which we illustrate. The hot water heaters made by the latter company are composed of hollow rectangular sections, joined at their corners, one to another, and through each corner of which the contained water circulates. It is evident that at the meeting points or corners of these superimposed sections the surfaces should be in true planes. This is the more important since these



THE PRATT & WHITNEY FOUR-SPINDLE MILLING MACHINE.

the headings: 1, Station and Distribution Expenses; 2, Repairs; and, 3, General Charges. In the result it appeared that the amount of the supply was unlikely to affect the working cost favorably to any substantial effect. The experience of the cost of supply in London showed that the total expenses had increased in direct ratio to the total output, added to a constant representing the minimum cost of working the undertaking irrespective of the output. There was no reason to believe that experience in relation to hydraulic supply in London was likely to differ materially from that of other undertakings established for supplying energy in towns from artificial sources. If works were planned on a moderate scale in relation to the probable output, and would allow of extensions as required, the minimum cost of supply would be approximated to within a comparatively short

the Pelton water wheel for high pressures, especially for driving dynamos, in substitution of the hydraulic engines hitherto used. By this apparatus 66 per cent. of the hydraulic energy could be converted into electrical energy, which could be obtained in this way at a cost of about 6 pence per Board of Trade unit. The electric lighting of Antwerp was being established on a combined hydraulic and electrical system of this kind devised by the late Professor Van Rysselberghe of Ghent.

The framers of the Wilson bill, says the *Troy Times*, having classified hydraulic hose, which is used exclusively for extinguishing fires, among articles of wearing apparel, no doubt will remodel that extraordinary measure so as to include hydraulic rams and spinning mules in the live stock schedule.

heaters are subjected to high pressure under test, and any irregularity in the surfaces of the corners would result in serious trouble. This machine was therefore designed to mill, at one operation, the four corners on the top and bottom of one of these sections. It consists, as shown in the three engravings, of a bed, platen and standards similar in some respects to those of a planing machine. The platen is provided with suitable gearing, by means of which it is moved to and fro between the standards. Mounted on the platen in such a way that they can be placed at any desired distance from each other are two chucks, between which a section is held. Each standard is mounted in guides at right angles to the bed so that they can be placed at the proper distance apart to suit the width of the section to be milled. Each standard is provided

with two horizontal spindles carrying the milling cutters. The lower spindle is stationary, but the upper one is adjustable longitudinally for a short distance in order to bring its cutter in the same vertical plane with the one below it. The machine will mill parallel surfaces on work 24 inches wide, or between the pairs of cutters, and will admit work 49½ inches square. All the engravings show the method of driving the cutters. Extending across the machine at the foot of the standards is the driven shaft. Beveled gears on this impart motion to a vertical shaft on each standard. From these the spindles are driven by gearing as plainly shown in the perspective view.

An Iron Ore Collapse.

On the 11th inst. the Penokee & Gogebic Consolidated Mines passed into

land shut down and its pumps were removed. This means that the owners cannot see their way clear to mine a ton of ore this year. The Penokee & Gogebic Consolidated Mines are capitalized at \$6,000,000. Among the principal stockholders are the Rockefellers, Charles L. and Joseph L. Colby, Edwin H. Abbot and Colgate Hoyt.

The property first came into the hands of the Penokee & Gogebic Development Company, of which Charles L. Colby was the head. In 1884, being doubtful about the value of the mine, Mr. Colby and his associates leased it for three years to Mather, Morse & Co. of Cleveland. In those three years, it is said, Mather, Morse & Co. made a very large profit out of it. In 1887 the property reverted to the Colby syndicate, and it was operated by them until it passed into the control of the Penokee & Gogebic Consolidated Mines corpora-

keep the stock down in price. The Gogebic and Cuban properties were to be turned in without incumbrance, and on this understanding the bonds were given Mr. Rockefeller. He has been unable to make the arrangements expected and the receivership is the latest move. This means that the properties will not be included in the Lake Superior consolidation, and that the \$1,300,000 in bonds which were turned over and for which, so the Duluth stockholders thought, very little equivalent was received, will be returned.

The high tower on the Board of Trade building in Chicago having been found to have sunk several inches, will be pulled down.

Aluminum has been found adaptable to many purposes, and constant announcements are made of some new

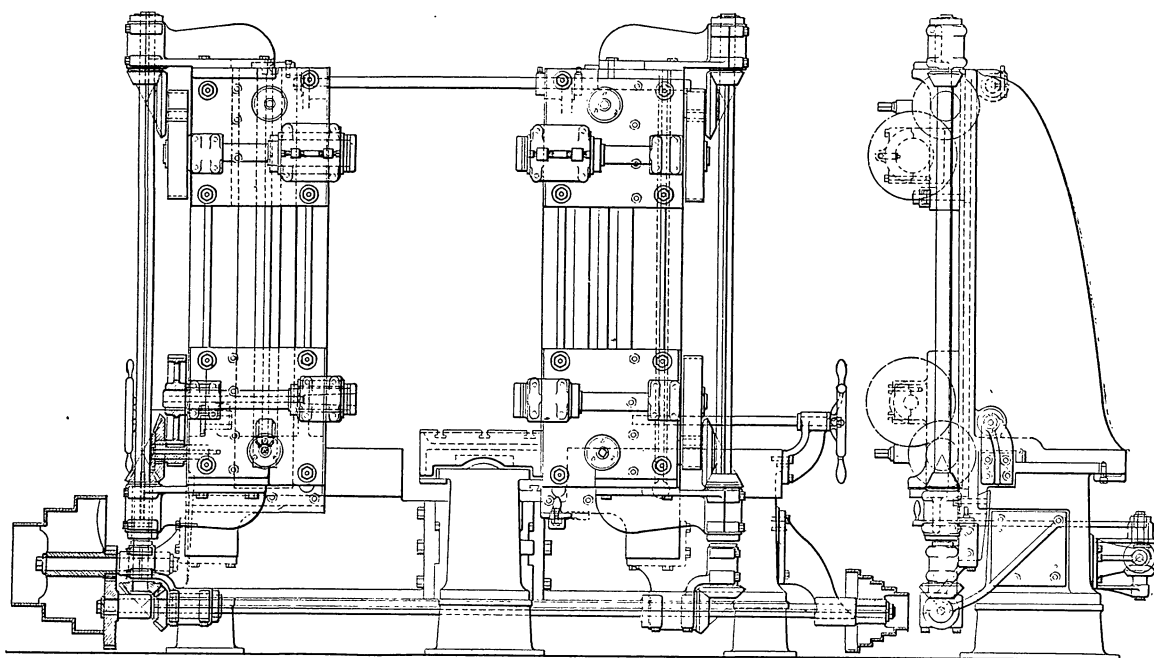


Fig. 2.—Front Elevation.

Fig. 3.—Side Elevation.

THE PRATT & WHITNEY FOUR-SPINDLE MILLING MACHINE.

the hands of receivers by order of the court at Madison, Wis. Charles F. Rand of New York was appointed receiver of the company's interests in Wisconsin and Michigan and took immediate possession of the property. The Penokee & Gogebic Consolidated Mines controlled what is known as the Colby group of mines, which includes the Colby, the Palms, the Tilken and Comet iron mines in Michigan and the Superior mine in Wisconsin, all on the Gogebic range.

A few days before the Farmers' Loan & Trust Company of New York began action to foreclose a mortgage of \$1,000,000 on the company's property, and the appointment of receivers is the result. The offices of the Consolidated Mines were removed from Milwaukee to New York on January 1.

The consolidated mines could have shipped this year at least a million tons of ore. More than half this amount may be said to be almost ready for market now, but there is no market. The company own a large interest in the Ashland and Aurora mines, at Ironwood, Mich., and last week the Ash-

land shut down and its pumps were removed. This means that the owners cannot see their way clear to mine a ton of ore this year. The Penokee & Gogebic Consolidated Mines are capitalized at \$6,000,000. Among the principal stockholders are the Rockefellers, Charles L. and Joseph L. Colby, Edwin H. Abbot and Colgate Hoyt.

The appointment of the receiver causes much speculation in Mesaba mining circles, for the move may have an important effect on the big syndicate known as the Lake Superior Consolidated Mines. When it was formed Mr. Rockefeller turned in his stock and bond interest in the Penokee & Gogebic Company at par and received in return, it is said, bonds to the amount of \$1,300,000, which, like all other bonds of the consolidated company, are secured by a trust mortgage covering all of the consolidated company's property. These interests, which included also Mr. Rockefeller's holdings in Cuban mines, were regarded as a very doubtful acquisition for the new consolidation, and have, it is said, tended to

use to which the metal has been put. The latest is in lithography, in which process it is claimed to possess many advantages over the stone now used, while fulfilling all the requisite conditions. The only stone used for lithography is found in Bavaria, and as the supply is diminishing its cost is increasing. Moreover, it is very brittle, and being rigid can only be used on flat surfaces. Under a recently patented process, we learn that aluminum plates, weighing from 2 to 10 pounds and costing from \$5 to \$10, do the work equally well, and that, being flexible, the plates can be molded into forms for cylinder presses. Aluminum plates are also coming into use in engraving in place of steel.

The decline in the value of iron ore property in the older Lake Superior districts is shown by a recent occurrence on the Menominee range. The Schlesinger syndicate in its palmy days paid \$85,000 for the leasehold of the Dunn Mine, at Crystal Falls. The mine ran behind during the depression of the past year, and among the obligations

unpaid were \$22,000 for royalties, and \$10,000 for freight to the Chicago & Northwestern Railway. The lease was sold under the hammer and bid in by the railway at \$28, which is in marked contrast to the high price paid by the syndicate.

Indifference to Boiler Firing and Management.*

BY D. ASHWORTH, PITTSBURGH.

Observations extending over a period of a quarter of a century in a practical and professional way have presented opportunities to note, in the greater number of manufacturing establishments, a continuous decline in the grade of service of those in the positions of firemen and boiler room managers, this corps of operatives seeming, at least, to have remained in *statu quo*. The evil has become so glaring and the results so palpably fraught with disaster, destruction and waste as to warrant an effort to call the attention of those who desire to progress to the false and inconsistent position they occupy by permitting such a narrow policy in management, so widely at variance with true economy, ignoring directly that the better intelligence renders the more valuable and hence more profitable service.

It goes without saying that during the past ten years the concentration of efforts by scientists and eminent mechanics looking to the more perfect development of the steam engine in its various types has produced results which challenge the admiration of the most critical in this line of thought.

Within the same period, from every source, there have been a multitude of features in the form of designs and novel application of boilers, all converging to the important factors of increased economy, efficiency and safety. In the engine sphere, condensing, compound and triple expansion engines, with and without jackets; in brief, seemingly all the necessary refinements have received, and are now receiving, close attention. In the boiler domain there has been also the evolution from the plain cylinder type to tubular, and from that through the multifarious forms of water tubes, each striving for a superior degree of excellence. Combining these forces—viz., the boiler and the engine—the amount of research and practical application that have been and are being applied for efficiency and economy are such as to be incalculable. A retrospect of the past, viewed in the light of present results, shows that these efforts have been of an exceedingly fruitful character.

The development has carried with it the imperative advancement of those in charge of engine management to such an extent as to create almost anew this body of men. Such an intellectual advancement in the department of mechanics, we believe, is without precedent, and in every sense challenges universal admiration from every quarter. Notwithstanding these favorable features, we are constrained to say that all this somewhat like the play of Hamlet with Hamlet left out, or, in other words, we are really defective at the very threshold of this field, by reason of relegating the firing of boilers to the most ignorant of operatives; or, to put it in a plain way, there seems to be an almost unanimous idea that any one who

can shovel and throw fuel is good enough for a fireman. Close observation and contact for a period of years with numerous plants of varied character increase the conviction upon this point. Recognizing, as we all do, that the furnace of the boiler is the prime feature and great initial point from which is the source of power, does it not properly follow that if economy and efficiency are deserving of efforts in the advanced stages, as has already been pointed out, this is the very point that should be treated with every consideration of intelligence? Should not the fuel, furnace and boiler receive the thoughtful attention that the engine receives from the careful engineer? I think this will be accepted by every one interested in advanced ideas. No one, I think, will question the fact of the importance of the initial point of the boiler and its furnace, and that upon its mismanagement the efforts of refinement are rendered, in many cases, completely void. It would seem so simple that argument would be unnecessary, were it not that, on every hand, the matter is entirely ignored, resulting in waste and destruction. We would ask, are not the efforts of the best furnace designers completely set at naught often by reason of the manner in which they are operated? Is it not a glaring fact that in all large cities where smoke abatement has been and is being attempted, the great stumbling block is the low grade of intelligence and indifference of the operatives.

In looking upon this subject from a mechanical and engineering standpoint, we are fully alive to all the requirements to give complete combustion and thorough distribution of heat units; proportion of grate area and openings, proper amount of air, conduction of the heated gases, are all carefully considered. When all is completed, we have had the wonderful spectacle of these conditions being turned over to the simple treatment of ram-jam shoveling and slice bar operations. I claim that the fireman should know, at least, the elements of combustion, the importance of proper management of fires to produce the greatest results with the least expenditure of fuel. The intelligent engineer keeps this constantly in view as to steam economy; the valves, &c., receive his unremitting attention, unless he should be a mere starter and stopper—for such a so-called engineer can be properly placed upon the same plane as the fireman that shovels without intelligence or judgment.

Now, it may be said that this is being greatly overcome by the application of mechanical stokers, a point that is frequently (and, I believe, without thinking) claimed by those interested in placing stokers. This is a great mistake, well known by those conducting tests, the results always being superior with the greater intelligence of the operator of the machine.

This deplorable and absurd state of affairs is doubly aggravated by, not simply indifference, but actual encouragement, based upon the idea that any one can shovel and throw in; or, perhaps, it is the idea of—they put it in the slot and we do the rest. Does it ever occur to these proprietors or the superintendents of manufacturing establishments that, while they are straining at gnats in the refinements of every application in the various departments looking to economic results, right upon the threshold they are swallowing a camel with the greatest ease?

Within the past few years in every community where cleanliness, taste and health are considered there has come forth a crying appeal to the authorities to lessen the great evil of smoke in the atmosphere. In response to this, inventive genius has promptly come forward. The multitude of devices that have been perfected and put in operation furnishes ample testimony of this fact. Many of these, when properly operated, accomplish satisfactory results in smoke abatement, but no inventor has ever had the temerity to label his machine or furnace, "No skilled fireman required." Per contra, it is well known that the most intelligent fireman produces the best results; and it is also an undeniable fact that the best devices are set at naught by incompetent operating. The writer has been brought in contact with large fields of boiler practice, and in many cases, aside from other disqualifications, the firemen were unable to speak or understand a word of the English language. It may be said, as I have heard it said, that these men are not paid to think but to do. Well, they do do. They will do up a coal pile, furnace and boilers with alarming rapidity. I say alarming to those whose views are broad enough to consider the initial and important points. On the other hand, it is a lamentable fact that there are a great number of men in official positions, as superintendents and proprietors of establishments, who seem to be utterly incapable, or unwilling, to note the importance of the necessity for a higher grade of labor in the firing and management of boilers.

One of the most surprising features in connection with this state of affairs is the tendency of those interested in placing boilers to claim, among their numerous merits, that of less attention required than others, precisely on the old exploded idea applied to engines, "no skilled engineer required." I have now before me a letter from a boiler representative who claims that his boiler will give the utmost satisfaction with one-half the attention that others receive.

What is greatly needed at present is to lay aside the idea that any one is good enough to fire and manage boilers. When you engage a man for your office do you not require that he shall possess some qualifications for the position? And if aptness is shown do you not show appreciation by advancement to a higher plane, the interest being mutual? Why not apply this to the selection of firemen? As it now stands, we cannot but exclaim:

"Strange, what a difference there should be 'Twixt tweedledum and tweedledee!"

There are many plants in operation where, by incompetency in this line, the steam efficiency is greatly lessened, furnaces and boilers working in neglected conditions, fuel wasted, and the community begrimed with volumes of unnecessary smoke; and, in addition to these evils, is, that of jeopardizing lives and property. Unless this matter is considered and such action taken as will improve this corps of operatives, it would seem absurd to be continually reaching and extending into the higher refinements of steam engineering when such simple and important features are ignored at the threshold.

Under these conditions, does not the pertinent question present itself to the employer: Are we not occupying a false position by this seeming indifference? Do we not retard the develop-

*Read before the Engineers' Society of Western Pennsylvania.

ment of a class of labor which, by a recognition, by an appreciation that some skill and judgment are required, would be animated by the smallest spark of ambition to qualify for advanced positions? Is not this condition of affairs a gross inconsistency—nay, a mockery—in the face of the query put by those guilty of this indifference: Why can we not get better men than these? In reply to that, we would state, simply, it is not sought on your part. Just as long as operatives of this class are looked upon as mere shovelers, throwers of coal and carriers of water, ignorance, with all its attendant waste, destruction of property and general demoralization, will be prominent in the boiler department.

As a fitting close to this, it would be proper to ask what degree of intelligence or knowledge would qualify one to fire boilers properly?

1. That the fires should be maintained with uniformity, and that no openings, in the form of bare places, showed upon the bars to permit cold air to pass through.

2. The judgment that will enable him, by a glance at the ash pit, to know at once, to a great extent, the condition of the fires.

3. He should know something of the various fittings of the boilers, such as valves, &c., and the details of the furnaces.

4. But not least, an ambition to grasp the details, so as to qualify him for a still higher plane, which would certainly follow, provided there was judgment enough in the superior to note such details.

Sufficient, we think, has been said to convince the most obtuse mind that the indiscriminate employment of labor for this purpose is a crying evil, and that some consideration should be given to the claims here made, that simply because one can shovel and throw, it does not follow that he is qualified to fire and have charge of steam boilers.

The Premier Steel Company.

A press dispatch from Indianapolis, under date of the 9th inst., says that a suit in which sensational charges are made was filed on that day by Receiver McGettigan of the Premier Steel Company against Newland T. Depauw, C. W. Depauw, and the Union Trust Company, as assignee of the concern. The complaint alleges that the Depauws, early in 1889 and a few months after the Premier Company were organized, paid R. W. Carroll, F. P. Protzman and C. F. Adams, all of Pennsylvania, \$1000 for the Adams process of making steel, a process that was only a mere experiment at the time. Through their influence over the Board of Directors, it is claimed that this process was sold to the Premier Company, in return for which the Depauws were given \$855,000 stock in the corporation. The contract by which the transfer of the Adams process was made is set out, and then the complaint charges that the process was transferred to the company for the purpose of fraud, by which large credits were secured and debts of over \$800,000 were contracted. The court is asked to force the Depauws to pay for their stock in money, to set aside the contract by which the Adams process was sold to the company, and judgment for \$900,000 is asked. The receiver offers to return the right of ownership of the process, with royalties, &c., to the Depauws upon the payment of \$855,000 in money.

Exhibit of the Creusot Works at the World's Fair.*

BY W. H. JAKUES

The exhibit of Messrs. Schneider & Co. at the World's Columbian Exposition, Chicago, assembling in one group specimens of the most diversified of their specialties and arranging so pleasingly the varied objects of their manufacture, gives a singularly impressive idea of the power as well as the variety of their means of production.

This summary of the progress achieved equally well in the domain of metallurgy as in that of mechanics and metal construction, is another manifestation of the vitality and flexibility of this organization, which for many years has pursued its purpose with the same unity of design, the same careful

mounted on a carriage fitted with spade trail and patent hydraulic brake. It fires fixed ammunition, composed of 0.75 kg. (1½ pounds) of C-2 powder and a 6.5 kg. (14½-pound) projectile in a metallic case, with a velocity of 500 m. (1642 foot seconds.)

The Schneider system of rapid firing ordnance is further represented by a 120-mm. (4½-inch) 12½-caliber field howitzer and a 50-caliber gun of 12 cm. (4½ inches). This gun, much discussed by artillerists, is distinguished by its simplicity of construction and working and the strength of its parts. The interrupted screw breech mechanism works quickly and easily and is fitted with firing devices arranged for either percussion or electric primers. It possesses the requisite elements for the rapid firing of metallic cartridges—a long traveling extractor worked by a shock; and the employment of safety devices for preventing the unscrewing



HENRI SCHNEIDER.

government, always striving to adapt itself to the requirements of modern progress, always on the lookout for new methods, in the van in all the new industrial discoveries.

In no branch has more rapid progress been made by this company than in war material; therefore Messrs. Schneider & Co. have given it the place of honor, justified in so doing by their recent success in everything connected with the manufacture of guns, particularly rapid fire, whose breech mechanism has been adopted by the French navy for the 14-cm. (5½ inch) guns for the armorclad Charles Martel; also in connection with the manufacture of the nickel steel armor, of which they were the promoters and that figured so successfully at the Annapolis tests of September 18, 1890.

Creusot exhibits in the first of these two categories a 75-mm. (2½-inch) quick firing field gun of the Schneider system, mounted on its carriage and ammunition limber. The gun is 33.3 calibers long, is built of steel and

of the breech block, firing before complete closing of the breech, and the opening of the breech in case of misfire. Finally, a rifling that avoids wear on the band of the projectile, but which assures to the latter plenty of energy during its passage through the bore.

The principal details of this gun are: Total length, 6 m. (19.69 feet); total length in calibers, 50; weight, including breech mechanism, 3550 kg. (7164 pounds); weight of projectile, 22 kg. (48.5 pounds); weight of cartridge case, 9.2 kg. (20.28 pounds); total weight of cartridge with BN powder and common shell, 39.45 kg. (86.97 pounds); weight of carriage without shield, 2850 kg. (6283 pounds); weight of shield, 70 mm. (2.8 inches) thick, 3950 kg. (8708 pounds).

The following are the average results obtained: Time to fire ten rounds against a fixed target, pointing each shot, 72 seconds; time required to fire ten rounds against a movable target, 90 seconds; velocity recorded 30 m. (98 feet) from the muzzle, using from 8.25 kg. to 8.5 kg. (18½ to 18¾ pounds) BN powder, 801 m. (2628 foot seconds); c responding muzzle velocity, 818 m.

* From an article in "Halligan's Illustrated World's Fair."

(2684 foot seconds); pressure corresponding to this velocity, 2820 kg. (40,108 pounds per square inch).

In the class of permanent fortifications, Creusot exhibits a disappearing turret for 57-mm. (2 24 inch) rapid fire gun of a type of an extensive order of the Roumanian Government, part of which was given to Messrs. Schneider & Co.

This turret, whose finished construction was considered by the Reception Committee to meet very satisfactorily the requirements of the specifications, is out of sight during a bombardment, and is visible only when an opportune moment occurs to discharge a series of shots. It can, however, be fired by successive elevations, maneuvering and putting into battery being effected very quickly. Only two men are required to serve it—a gunner and an assistant. There are two other models, scale one-twentieth: one a turret for coast defense

Finally, a model, scale one-twentieth, of a French torpedo boat 36 m. (118 feet) in length, while just beyond is shown a spoon shaped launching tube, mounted on a center pivot carriage. It is constructed on the model of those furnished the Japanese Government by Creusot.

Among the types of stationary engines recently built by Messrs. Schneider & Co. there is one immense installation of which the water-color exhibit gives but an idea. We refer to the compressed air plant in Paris for the Compagnie Parisienne de l'Air Comprimé, one of the most interesting of its kind. It consists of four 2000 horse-power engines and four sets of multitubular boilers with economizers.

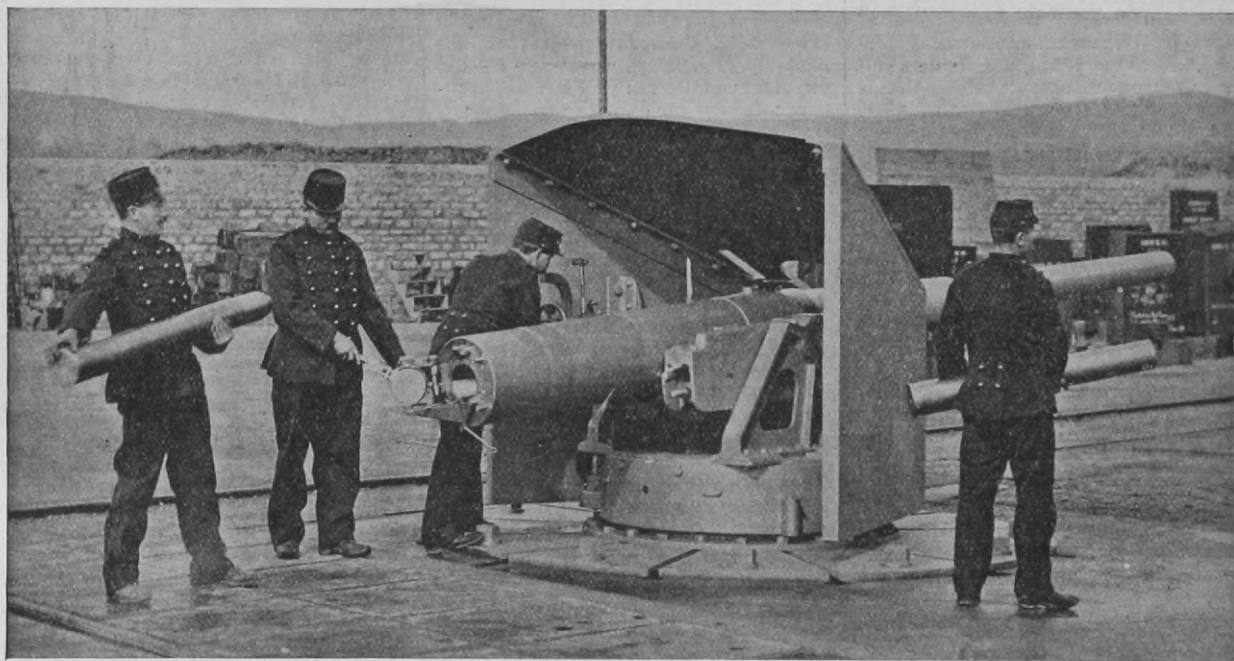
The engines are vertical, steam hammer type with three cranks and are direct acting. The compressor cylinders are placed above and in a line with the steam cylinders. The total height

ments at each end and on four steel piles equally distant from each other.

The two shore piles are 143 feet high. One of the middle piles is 222 feet high, the other 248 feet high.

The bridge over the Borcea, now being built for Roumania, has a center span of 459 feet and end spans of 457 feet. The Morand bridge, over the Rhone at Lyons, is built of steel throughout and its three circular arches are very artistic.

Creusot's exhibit is artistically installed and all of the articles beautifully finished. Though small in comparison with the displays that Messrs. Schneider & Co. have made in other countries, it is comprehensive and complete and particularly appreciated, because, with the exception of the exhibit of Arbel of Rive-de Gier, it is the only one that had the honor to represent at Chicago the great metallurgic industries of France.



THE SCHNEIDER 4 11-16 INCH RAPID FIRE GUN.

for two 24-cm. (9 44-inch) guns, the other a fortress turret for two 15 cm. (5 7/8 inch) guns.

By the side of these works of military art, which certainly constitute one of the greatest attractions of their exhibit, Messrs. Schneider & Co. have sent to Chicago interesting specimens of steel castings, hardened steel plates for gun carriage shields, large samples of soft steel, armor bolts, steel for bursting shells, collection of iron sections, &c.

As the French navy has intrusted the construction of a large number of marine engines for war ships and torpedo boats to this company, Messrs. Schneider & Co. have not omitted to show us some of the latest designs of these engines and small vessels that for so many years have had such a high reputation.

There are three models of a one-tenth scale: one a horizontal triple expansion engine of 4000 indicated horse-power for the twin screw torpedo cruiser "Watignies"; another, a vertical triple expansion engine of 8000 indicated horse-power for the French twin screw cruiser "Alger"; the third, a vertical, direct acting, triple expansion engine for a torpedo boat 36 m. (118 feet) long.

of the engines is about 40 feet. The motor is triple expansion, and the air compressor, for which the Compagnie Parisienne have adopted the Riedler system, is compound with three cylinders. The total weight of the four engines is 1773 tons, and each of the large steam cylinders weighs 29 1/2 tons.

Another compressed air plant installed at the Blanzy mines is shown by a tenth scale model. In the same section is a horizontal high speed engine of 150 horse-power, single steam cylinder with four distributors, automatic expansion, without disengaging arrangement, specially designed for dynamos, the manufacture of which forms another important industry of Creusot.

Messrs. Schneider & Co. exhibit an alternate current dynamo of 50,000 watts (system Zipernowsky, Deri and Blathy), for the manufacture of which they have the sole right in France.

In such a short review we can only refer to the types of locomotives shown in group 80, and pass almost in silence the models and water colors of some of the viaducts and bridges built by Creusot. Among these is the five-span viaduct over the Malleco in Chili, the main beams of which have a total length of 1141 feet, resting on masonry abut-

The products of this vast establishment are so numerous that it is impossible to do them justice in such a brief sketch. But we trust it will be adequate to recall the high reputation Messrs. Schneider & Co. have so long enjoyed.

Scrap from the Fair.—Large quantities of scrap are now being thrown on the market by the demolition of the World's Fair buildings. Water pipe is to be removed from the grounds, copper electric light wires from the grounds and buildings, steel rails from the yards and structural work from the State and foreign buildings. Of steel rails alone, some 3000 tons have been sold fit for relaying. The process of demolition has not yet extended to the main exposition buildings, as the goods of exhibitors have not all been removed. At a recent meeting of freight officials at Chicago it was agreed that car-load shipments of iron and steel which have been used in fair buildings be charged at fifth-class rates to points in Central Traffic Association territory, it being understood that generally the material will be reused in the construction of buildings or bridges. If such shipments are offered with a ship-

ping statement that the material is to be melted they may, upon approval of the Chicago Freight Committee, be taken at rates for scrap iron.

Canadian Notes.

Canadian metal producing and metal consuming industries got to the end of the old year in tolerably satisfactory condition. We had depression here as they had everywhere in 1893, but it did not fasten on any organic interest such as the currency, the banking system or an essential of general industry, as in the United States, Australia and England. Interest has been high since spring, and advances have been obtainable only on the soundest securities, but this has been rather a healthy state of things for well established concerns. It has protected them from new and weak competition. The Nova Scotia furnaces appear to have extended their trade considerably at the expense of imports. The manufacturers of implements, machinery, engines, boilers and hardware have done a business that is considered far from bad for last year. The stove and furnace makers have less to say about their business. The great set back to real estate activity in the cities has checked building, and therefore has diminished the demand for furnaces. The rolling mills throughout the country are now shut down and will be till February.

The brass and ornamental metal works of E. Chanteloup & Co., Montreal, have been sold.

Work has been begun in the new smelting works in Hamilton.

The Toronto Radiator Company are erecting very extensive new works adjoining those they now occupy.

The new rolling mills erected in the western part of Toronto—the McDonnell Rolling Mills Company's works—are now ready for operations.

Umbrella manufacturers are agitating for a removal of the duty on steel tubes, which are now so largely taking the place of wood for umbrella handles. The duty on these tubes is 30 per cent., and the manufacturers claim that it prevents them competing successfully with imported umbrellas.

In 1890 the Government renewed the duty on mining machinery, but in such a qualified way as to retain for home manufacturers of such machinery the protection they had previously enjoyed. It placed mining machinery on the free list, but only for three years and only for such machinery as was not produced in the country. The time has expired, but free mining machinery has been given another three years' lease. This clause of the tariff has been the occasion of much irritation to the mining companies. At the outset it was nearly impossible to get any of their machines into the country, as manufacturers here would claim they made such machines. The interests of our nickel wealth required that no obstacle should be put in the way of mining machinery whose manufacture in this country was a mere fiction. In turn, however, the manufacturers here began to do some fault finding, for they now contend that under this clause of the tariff there are many things admitted free which are produced here. The customs officials construe the clause to mean that mining machinery shall be free if the same "make" is not produced under patent

or by piracy here. Thus, if a steam pump is entered, they do not ask if there are steam pumps made in Canada, but if that particular kind is. If it is, the duty is collected; if it is not, no matter how many other kinds are, the pump comes in free. Both the miners and manufacturers, therefore, are dissatisfied with the clause. The mining associations have prepared a list of the machines that in their view are admissible free, and want that list made the basis of guidance for collectors. The manufacturers oppose the adoption of that list, as they claim that it comprehends much that is made in this country.

The iron and steel duties have a very uncertain future, and their maintenance at present rates is largely dependent on the ultimate shape the United States tariff takes.

The competition of American and German wire was hard on the prices and the profits of domestic manufacturers during 1893. The Dominion Wire Mfg. Company held their annual meeting in Montreal and elected directors as follows: F. Fairman, president; James Cooper, vice-president; J. G. McCormack, secretary-treasurer; J. Murray and J. R. Stewart.

The producers of pig iron and the manufacturers of bar iron are looking forward with very different feelings to the prospect of an increased duty on wrought scrap. The smelting companies are urgent for the change, while the rolling mills people will resist it to the utmost. As long as wrought scrap comes in at the present duty they can make bar iron at a cost much below what would be possible if they used domestic puddled bars. Yet their selling price rises to the limit of protection. They are naturally opposed to a change in the duty that would annihilate so much profit.

The McMaster Mfg. Company of Orangeville have bought for \$8000 the Haggart foundry property of Brampton. The ratepayers of the latter town took a mortgage of \$75,000 on this property a few years ago.

The iron manufacturers' associations are holding their annual meeting in Toronto. They consist of the makers of bar, hoop and sheet iron, the makers of wire, of cut and wire nails, of nuts and bolts, of horseshoes, horse nails, &c. There are several matters up for consideration besides the usual internal causes of friction and irritation. Of course, the old accusations of underhanded price-cutting are to be heard and examined. In nails, especially wire nails, there are said to be numerous grievances owing to violation of the terms. Other questions hinge on results of the depression in the United States and on the uncertainty of the tariff. The extremely low prices at which wire nails are now listed by American manufacturers make our prices look exorbitant, and the comparison lends strength to the agitation for a lowering of the duty. Some lots, moreover, are reported to have found their way across the border to this side. That would demonstrate the need of lowering prices in self defense as well as out of respect for the looks of things. The proceedings of the association have not been allowed to leak out yet, but lower prices are expected to be adopted for wire nails.

The imports of British pig iron continue to fall off and the stock in the country is lighter than usual for the

period between the closing and the opening of St. Lawrence navigation. The coal strike undoubtedly had a perceptible influence in diminishing our imports, but the strong drift toward domestic and American irons is sufficient of itself to account for most of the reaction.

Paying Wages with Bonds.

Reference has been made by Mr. Johnson, a member of Congress from Ohio, to the method of paying wages with bonds at the works of the Johnson Company of Johnstown, Pa., with which Mr. Johnson is connected. The company took some contracts, accepting in payment street railroad bonds.

They are now paying their men in part cash and part company bonds, payable some time in the future. The men get one-third cash and two-thirds bonds. The bonds are payable to bearer and are issued in denominations of \$1 and \$5. The pay day is weekly, on Saturday. Each employee then receives two envelopes. One contains one-third of his wages in cash, to be retained. The other contains two-thirds of his wages, also in cash, but is immediately to be handed back to the company, and the workman goes through the form of buying bonds. Some of the storekeepers will take these bonds in payment for goods, but only when their full value is bought, as they will give no change.

Mr. Johnson states that the first series of what he calls certificates has already been redeemed at par.

The Old Water Mill.—J. Wood & Bros. Company of Conshohocken, Pa., have published a highly interesting picture of their "Old Water Mill," which probably was the first to manufacture light sheet iron in America. Erected in 1831 by James Wood, it has continued in operation ever since—for 63 years—under direction of himself and direct descendants. While a considerable part of the old machinery yet remains, it was never equal to so much work as it is to-day. The tonnage of the old mill at the start and for some years afterward was only about 300 tons of No. 24 to No. 28 per annum. Now the production is from 2200 to 2400 tons. By reference to their old books J. Wood & Bros. Company find that during its early days the product of the mill sold at \$160 to \$170 per ton, when it is selling now at one third of that figure, if not less. Although the old mill has not known what it was to stop night or day since 1831, it is pronounced as able now to hold its own against all competitors as it was when it practically had none to contend against.

An elaborate contribution by A. Bor-sig on the influence of additions of aluminum to pig iron is printed in *Stahl und Eisen*. His investigations confirm, on the whole, the reports of Keep and others.

Another steel hull steamer to cruise in Southern waters has just been completed by James Rees & Sons of Pittsburgh, the boat being of about 35 tons burden. It measures 60 feet in length, with 13 feet beam and about a 6 foot depth from the boiler deck to the keel. The boat was built for a firm in Cuba called Salinas de Cayo Romano Company. The latter are interested in the development of salt deposits on a key

about 9 miles distant from the mainland. It was for transporting the product of the key to the mainland that the boat was built.

The Profits of Belgian and French Iron Works.

The beginning of the year brings a number of annual reports of some of the large steel works in Belgium and in France. Foremost among them is the famous John Cockerill Company of Seraing, who cover a very wide range in their products. The company have coal and iron mines and coke ovens, produce the whole range of material for railroads, build cars, have enormous machine shops and large shipbuilding yards. One of their specialties is also the construction of bridges. The latest addition is a shop for making projectiles and guns. The company have a capital of 15,000,000 francs and estimate their assets at 21,282,000 francs, 5 francs, roughly, being equal to \$1. The gross profit was 3,444,504 francs, of which 1,469,570 francs was used for writing off, 4 per cent. on building and 8 per cent. on manufacturing plant. A dividend of 1,500,000 francs, equal to 10 per cent., was paid, which was an increase of 1 per cent. over the previous year. Three hundred and one thousand francs were carried over to the next year. On June 30, 1893, the Cockerill Company employed 9269 men, to whom 9,550,650 francs were paid in wages. The company contributed 140,197 francs for pensions and assistance to sick and needy workmen, and 112,590 francs for medical treatment and drugs.

The Angleur Steel Works, another one of the larger Belgian plants, have a capital of 9,500,000 francs. The gross profits were 1,386,073 francs, which were distributed as follows: 270,562 francs interest on bonds, 300,000 francs written off, 295,750 francs general expenses, and 475,000 francs, 5 per cent. dividend. The mines of the company produced 181,354 tons of ore, while the furnaces turned out 96,976 tons of pig iron. The coke works yielded 59,404 tons, while the steel works produced 52,600 tons. The total of the product of the rolling mills was 79,858 tons.

The Longwy Steel Works are one of the famous works of the Loraine district. The profit of this concern, on a stock capital of 20,000,000 francs, was 3,727,500 francs, out of which sum 1,400,000 francs, or 7 per cent., was paid as dividend, while 2,012,300 francs were used for canceling outstanding securities and for writing off. In the two previous years the company paid 5 per cent.

The Forges et Acieries du Nord et de l'Est had a very prosperous year, making a profit of 2,588,823 francs, out of which a dividend of 11 per cent. on the share capital of 12,000,000 francs was paid, the dividend in the two previous years having been 9 and 6 per cent., respectively.

Saint Etienne also did exceptionally well, realizing a profit of 1,179,207 francs, out of which a dividend of 12 per cent., or 480,000 francs, was paid, 348,348 francs being utilized for writing off and 300,000 francs being put into a reserve fund for new plant.

Firminy also boasted of a very good year, distributing 17 per cent. dividend, equal to 510,000 francs, as compared with 15 per cent. during the previous year. The gross profit was 1,343,000 francs, of which 323,254 francs were

written off, and 286,175 francs were put into a reserve fund.

It will be observed that throughout the foreign works assign very large sums out of their gross profits for depreciation of property by writing off, and that on the whole stockholders are only allowed a relatively small proportion of the gross profits earned.

The Duluth Mfg. Company.

The works of the Duluth Mfg. Company, at West Duluth, Minn., are unique. The plant is the largest single manufacturing enterprise at the head of the lakes. All kinds of cars but passenger cars are built, together with mining machinery, milling supplies and architectural, bridge and dock work.

The shops and foundries cover nearly 15 acres of ground and include a rolling mill, axle forge and blacksmith shop, car wheel and soft foundry, machine shop, wood working shop, lumber department, planing mill department, ware and storage houses and office.

The forge works are equipped with one 6000-pound hammer and two each weighing 2500 pounds, and manufacture shafting and other forged articles up to 10 inches in diameter. The rolling mill is fitted with two trains of rolls, one 10 and the other 18 inches and turns out bar iron from $\frac{1}{4}$ to 10 inches.

The blacksmith shop is a new building completed early in the autumn and is supplied with the newest and best machinery.

The wheel foundry can turn out 200 cars wheels per day and the capacity of the soft foundry is 50 tons of castings in the same length of time.

Fifteen freight cars complete a day is the average output of the shops.

Two specialties, one a logging car and the other a dump car for mine stripping and general contracting work, are manufactured, and each has taken a leading place among cars of its class.

This plant as a car factory is the most complete of any in the world, in that it manufactures more articles which enter into the construction of a car than any other. The lumber is cut at its own mills, sawed and planed, and the bar iron, wheels, axles, castings, nuts, braces, lag screws, &c., are all manufactured by this company. Were it not for patented articles the only purchases of manufactured material would be paint, nails and springs.

The present officers of the company are: L. G. Matthews, president; H. H. Hanford, vice-president; O. H. Simonds, secretary; William Macalster, treasurer; F. H. Duesler, auditor; R. L. Ettenger, superintendent, and W. J. Matthews, assistant president. The works were located at West Duluth in 1889.

Dr. Wm. M. Sweet, special agent of the Census Office for the collection of the statistics of iron and steel in the census year 1890, has completed his task and submitted his final report.

At Pittsburgh coal for domestic use is selling at lower prices than ever before known; 1 and 1 $\frac{1}{2}$ inch coal, the regular domestic variety, is being delivered at 5 $\frac{1}{2}$ cents a bushel, or \$1.45 a ton of 26 $\frac{1}{2}$ bushels. Even at this low figure the demand is reported light, owing chiefly to the mild winter. When the winter is mild the supply of natural gas is abundant, thus materially affecting the demand for coal.

Sulphur in the Basic Bessemer Process.

BY J. E. THOMPSON POTTSTOWN, PA.

The problem of the elimination of sulphur from pig iron, previous to its conversion into steel, or during this conversion, has been more or less prominently before the metallurgical world for the last three years, and the following remarks descriptive of the practice of a prominent iron company at their basic bessemer steel plant may be of interest to metallurgists. The last run of the Bessemer plant covered a period from August, 1890, to August, 1893.

In making dead soft material, or "flusseisen," it is especially necessary to have the carbon, silicon, sulphur, phosphorus and manganese in the steel as low as possible and at the same time to have the steel perfectly free from redshortness. The basic Bessemer process removes carbon, silicon and manganese almost entirely; and in the works above referred to the elimination of phosphorus is accomplished to such an extent that about 95 per cent. of the steel product contains less than 0.05 per cent. phosphorus. The carbon and manganese in the steel are controlled by the quantity of recarburizers added to the molten metal when blown, so that sulphur is the one element which gives any trouble. Our efforts have therefore been of late months directed toward devising some process or mode of procedure whereby this element may be kept in harmless limits.

It will first be well to trace briefly the metal from the blast furnace to the casting pit, in order that a good understanding may be had of the conditions under which occurred the sulphur phenomena which I shall later describe. The blast furnace is naturally the first place at which to correct high sulphur tendencies, and we find it advantageous to use low sulphur ores, for the reason that, although the sulphur from high sulphur ores does not appear in the pig iron so long as the furnace is working hot, in irregular working the sulphur appears in considerable quantities. The low sulphur ores, however, during a period of cold running do not produce a pig containing sulphur in fatal quantities. It is, indeed, rare that any cast of pig iron contains more than 0.10 per cent. sulphur, and iron with this sulphur content is readily mixed in the cupola yard with enough better quality iron to bring the sulphur content of the cupola charge below 0.06 per cent. The basic pig iron from the blast furnace is cast in sand conveyed 3 miles to the cupola yard and unloaded; it is then loaded on hand bogies, hoisted to the cupola charging platform and charged into the cupola. The cupolas are acid lined. With the coke is charged about 1.6 per cent. of limestone and sometimes an additional 0.8 per cent. of fine lime, so that we have in the cupolas the curious mixture of basic iron and basic flux, acid sand and acid ganister rock. The resulting slag, containing about 45 per cent. of SiO_2 , is, therefore, powerless to remove any sulphur from the iron. As a matter of fact, a considerable quantity of sulphur is introduced into the iron while the latter is in the cupola. The iron is tapped from the cupola into a ladle, from which it is poured into the converter and blown, the entire quantity of fluxing material, pure lime, having previously been charged into the converter. The cold

ferromanganese is added to the converter as it is being turned down at the conclusion of the blow, and the spiegeleisen is shoveled red hot into the casting ladle as the steel is poured from the converter into it.

Remembering this course of the metal, we may say that the sulphur in any one blow has existed in three varying quantities: First, the percentage of sulphur in the metal charged into the cupola for that blow, which we shall call sulphur in the cupola mix; second, the percentage of sulphur in the iron tapped from the cupola for the same blow, which we shall call sulphur in the cupola metal; and third, the percentage of sulphur in the steel at the casting pit, which we shall call sulphur in the steel.

My remarks concerning the sulphur eliminating action of temperature, fluidity of slag, basicity of slag, addition of ferro and spiegel and overblowing are to be considered as corroborative testimony only. I am also aware that E. Prochaska has published, at the end of the notes in Phillips and Prochaska's translation of Wedding's "Basic Bessemer Process," some data regarding the absorption of sulphur by the basic pig iron in the cupola. Finally, it may be said that many metallurgists have suggested blowing a charge containing from 1 to 2 per cent. of manganese in the basic Bessemer converter, as a means of reducing sulphur, while Wedding, as lately as 1890, denies that the manganese content of the pig iron has any effect on the sulphur content of the steel.

The following diagrams, aided by explanations, will give a very good idea of how the sulphur behaves in the cupola and in the converter with varying quantities of silicon, sulphur and manganese in the cupola mix and in the cupola metal. The data for the curves are drawn from a series of 12,000 blows, all of which were normal and made in the regular course of running, and in plotting the curves there has been no selection of particular blows to support any statement. Each curve includes all the data relative to its two variables. The diagrams deal with the melted cupola metal only, and not with the pig iron charged into the cupola, as the latter changes greatly its composition in its passage through the cupola. The following short table, the cupola history of seven blows taken at random, will show at a glance the action of the cupola flux on the iron and will dispense with any description of the change occurring in the composition of the iron. The carbon and phosphorus are practically unchanged, the sulphur increased by the absorption of sulphur from the coke, and the silicon and manganese greatly and irregularly decreased:

| | | Silicon. | Sulphur. | Phosphorus. | Manganese. |
|---|-------------------|----------|----------|-------------|------------|
| 1 | Cupola mix..... | 0.510 | 0.058 | 2.43 | 1.09 |
| | Cupola metal..... | 0.435 | 0.153 | 2.46 | 0.481 |
| | Cupola mix..... | 0.851 | 0.024 | 2.41 | 0.945 |
| 2 | Cupola metal..... | 1.18 | 0.169 | 2.38 | 0.339 |
| | Cupola mix..... | 0.442 | 0.060 | 2.34 | 1.40 |
| | Cupola metal..... | 0.327 | 0.128 | 2.34 | 0.880 |
| 3 | Cupola mix..... | 0.394 | 0.054 | 2.28 | 2.00 |
| | Cupola metal..... | 0.448 | 0.124 | 2.38 | 1.15 |
| 4 | Cupola mix..... | 0.538 | 0.074 | 2.27 | 0.920 |
| | Cupola metal..... | 0.089 | 0.228 | 2.31 | 0.194 |
| 5 | Cupola mix..... | 0.224 | 0.025 | 2.41 | 0.980 |
| | Cupola metal..... | 0.079 | 0.094 | 2.80 | 0.362 |
| 6 | Cupola mix..... | 0.360 | 0.042 | 2.13 | 0.760 |
| | Cupola metal..... | 0.102 | 0.132 | 2.16 | 0.330 |

1. *Relation Between the Percentage of Silicon in the Cupola Metal and the Percentage of Sulphur in the Steel.*—Inspection of the diagram, Fig. 1, shows that there does not exist any marked relation between the silicon content of the cupola metal and the sulphur in the steel. The small percentage of silicon in the cupola metal evidently does not yield sufficient SiO_2 in the slag to affect materially its basicity and consequent power of sulphur elimination. On the contrary, there is a slight downward tendency in the sulphur in the steel as the silicon in the cupola metal increases. This is probably due to the fact that the higher silicon makes a hotter blow and, therefore, a more liquid slag, which is more potent to remove sulphur from the bath than a thicker slag of slightly greater basicity. That the sulphur content of the steel is also independent of values of silicon higher than those shown in

the slag and sulphur in the steel, is as barren of suggestions as the curve shown in Fig. 1.

2. *Relation Between the Percentage of Manganese in the Cupola Metal and the Percentage of Sulphur in the Cupola Metal* (see Fig. 2).—This curve is a regularly descending one, showing that as the manganese in the cupola metal increases the sulphur in the cupola metal decreases; i. e., as the manganese in the cupola metal increases, the absorption by the metal of sulphur from the coke decreases. This fact, although interesting from a metallurgical standpoint, is not vital, because, as will be shown later, this absorbed sulphur, be it much or little, is all blown out of the metal while in the converter, except in cold heats or in charges containing little manganese.

3. *Relation Between the Percentage of Manganese in the Cupola Metal and the Percentage of Sulphur in the Steel* (Fig.

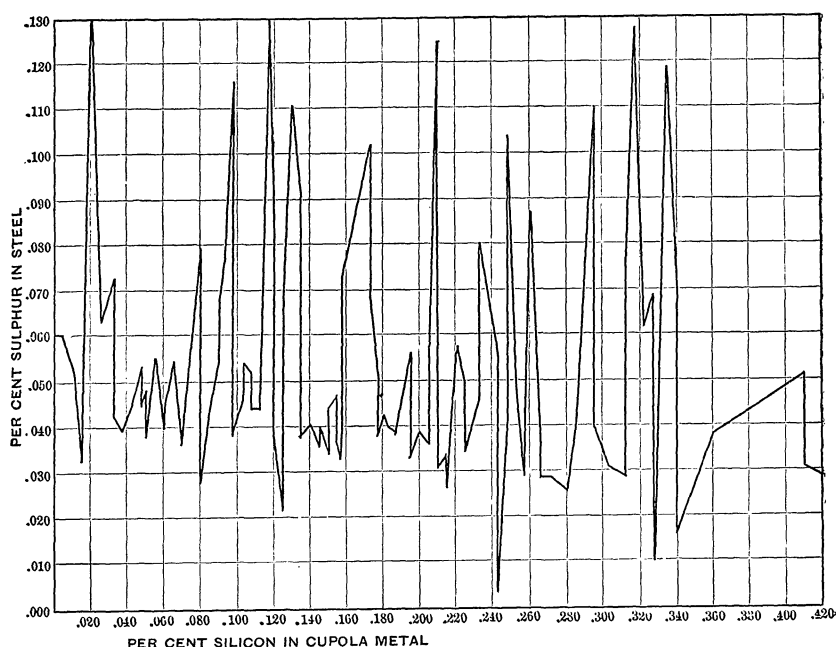


Fig. 1.—Relation of Silicon in Cupola Metal and Sulphur in Steel.

SULPHUR IN THE BASIC BESSEMER PROCESS.

the diagram is proved by this short table appended:

| Silicon in cupola metal. | Sulphur in steel. | Silicon in cupola metal. | Sulphur in steel. | Silicon in cupola metal. | Sulphur in steel. |
|--------------------------|-------------------|--------------------------|-------------------|--------------------------|-------------------|
| 0.440 | 0.093 | 0.468 | 0.081 | 0.523 | 0.092 |
| 0.440 | 0.003 | 0.485 | 0.083 | 0.550 | 0.018 |
| 0.448 | 0.025 | 0.495 | Trace | 0.625 | 0.074 |
| 0.448 | 0.038 | 0.505 | 0.031 | 0.840 | 0.090 |
| 0.453 | 0.021 | 0.515 | Trace | 1.33 | 0.096 |
| 0.458 | 0.010 | 0.523 | 0.029 | 1.98 | 0.027 |
| 0.458 | 0.036 | | | | |

The fact that there exists but little relation between silicon and sulphur during the blow is shown more directly by a comparison of the two sets of variables, SiO_2 in the slag and sulphur in the steel. The silica of the lime flux is a practically constant quantity, so that any change in the quantity of silicon in the cupola metal is immediately reflected by a like variation of the silica of the slag. The curve plotted from the above mentioned variables, silica in

3).—This curve, which may be regarded as a graphic summary of the most important points brought out in the entire investigation, will bear closer study. It is derived from the data furnished by 118 blows made at various times within the period mentioned at the beginning of this article. The blows represented may be roughly divided into three groups: first, those whose cupola metal contained 0.425 per cent. manganese or less; second, those blows the cupola metal of which contained from 0.425 per cent. to 0.700 per cent. manganese; and last, those blows whose cupola metal contained more than 0.700 per cent. manganese. Group number one produced all the high sulphurs in the series with a lower limit of 0.032 per cent.; group two produced no steel with a sulphur content higher than 0.051 per cent. nor below 0.039 per cent.; and group three produced steel varying in sulphur content from a trace to 0.051 per cent. Arguing from effects to causes, we may say that to produce regularly steel with a maximum of 0.05 per cent. sulphur it is necessary that the iron blown should contain at least 0.500 per cent. manganese; and that to produce very

low sulphur steel the iron blown should contain at least 0.700 per cent. manganese. To attain this quantity of manganese in the cupola metal, the iron from the blast furnace should contain from $1\frac{1}{2}$ per cent. to 2 per cent. of manganese.

The question now arises as to how much sulphur is actually eliminated by this manganese. It is generally acknowledged that all processes for removing sulphur from iron decrease in efficiency as the sulphur content of the pig decreases; that it is easier to re-

manganese in the cupola metal, the sulphur in the steel may be kept below 0.05 per cent., and also that this low sulphur content of the steel is the result of actual elimination of the sulphur by means of the manganese. In support of this latter proposition I submit the following analysis of the blows composing the several groups shown in Fig. 3. (A few blows are not included in this analysis, as the figures for the sulphur content of the cupola mix were wanting.)

IV. *Influence of Other Conditions on the Elimination of Sulphur.*—The sulphur content of the steel seems to be independent of the following conditions: Silicon in the cupola metal and silica up to 10 per cent. in the vessel slag, as before said; oxide of iron in the slag; phosphorus in the cupola metal; sulphur in the coke (when the iron carries manganese); sulphur in the flux charged into the cupola or converter; and, finally, to be independent of the quantity of sulphury cast scrap charged with the pig iron into the cupola. The percentage of sulphur in the steel is dependent principally on the percentage of sulphur in the basic pig iron charged into the cupola. If manganese be present in sufficient quantity in the cupola metal, sulphur is eliminated from the pig iron. This elimination is accomplished more completely if the blow be hot and the slag highly basic and not too thick.

We have never been able to remove sulphur by overblowing, unless the overblow was carried so far as to increase materially the loss. In nine blows the addition of 0.6 per cent. ferromanganese to the blown charge in the vessel effected an average additional reduction of sulphur from 0.056 per cent. to 0.047 per cent.; and in 56 blows the addition of from 1.2 per cent. to 2.8 per cent. of spiegeleisen to the metal in the casting ladle while pouring from the converter effected an average reduction of sulphur from 0.70 per cent. to 0.64 per cent., this latter series being consecutive blows made on high sulphur stock. Both the ferromanganese and the spiegeleisen effected a lesser proportionate reduction in the lower values of sulphur than in the higher. The addition of fluorspar and lime in the cupola and converter, calcium chloride and lime in the cupola ladle, calcium chloride, fluorspar or roll scale in the converter, has never effected any marked reduction of sulphur.

The ideal iron for basic Bessemer work, when this iron is to be remelted in cupolas, should be cast in chills and have a composition about as follows: Combined carbon, 2.75 per cent. to 3.35 per cent.; graphitic carbon, little or none; silicon, under 1.00 per cent.; sulphur as low as possible, maximum, 0.06 per cent.; phosphorus, 2.30 to 2.80 per cent.; manganese, 1.50 to 2.00 per cent. Such an iron, when remelted in a cupola and blown with about 15 per cent. of pure lime, will blow hot, take 500 to 1000 pounds of scrap in the converter and produce a good, sticky fluid slag. This slag will become fluid long enough before the nearly complete elimination of the phosphorus (when rapid oxidation of iron begins) to insure intimate mechanical admixture, by the blast, of fluid, sulphury metal and fluid, highly basic, manganiferous slag, or, in other words, the elimination of sulphur should proceed simultaneously with the removal of the last removable traces of phosphorus.

The large proportion of manganese in the cupola metal of certain blows did not increase the loss by conversion of those blows. The average loss was about the same whether the manganese in the cupola metal was low or high. The increasing manganese in the cupola metal yields hotter blows, and the manganese replaces oxide of iron in the slag, leaving the loss unchanged.

Duluth is employing married men who are out of work on municipal improvements at \$1.25 a day.

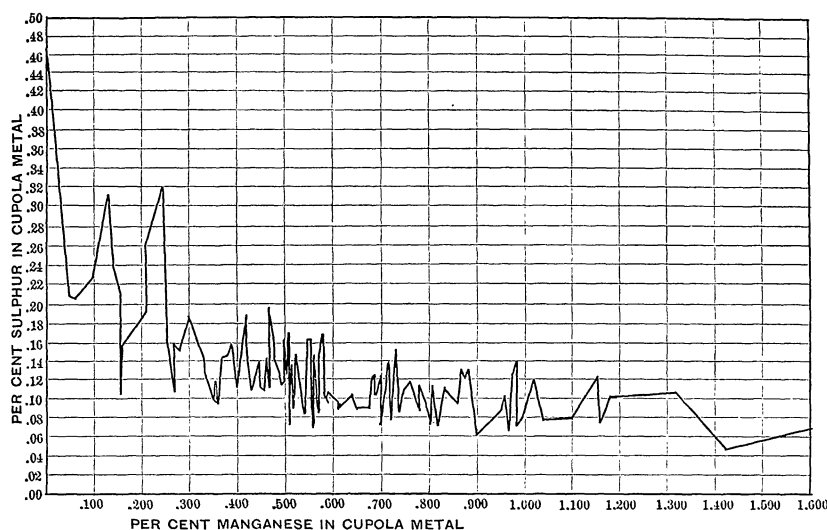


Fig. 2.—Relation Between Manganese and Sulphur in Cupola Metal.

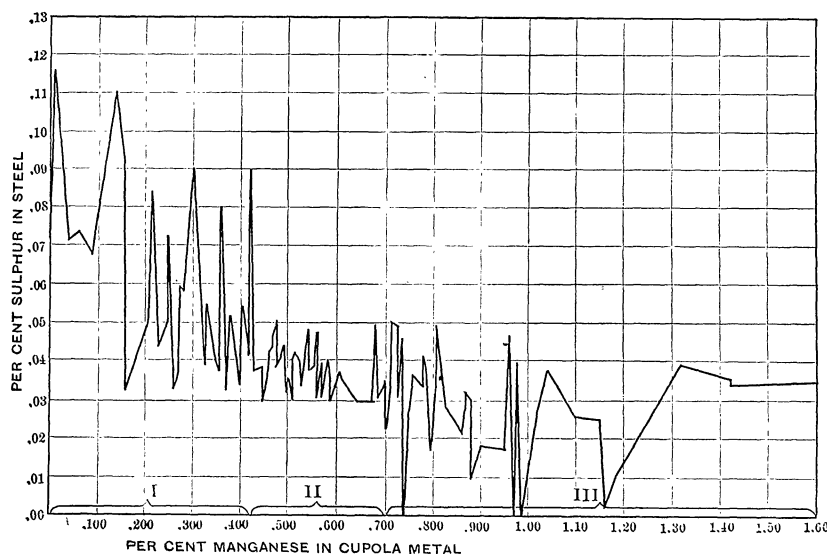


Fig. 3.—Relation of Manganese in Cupola Metal to Sulphur in Steel.

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move 80 per cent. of the sulphur in a pig iron containing 0.350 per cent. than to remove 20 per cent. from a pig iron containing 0.05 per cent. In basic Bessemer practice, especially in making "flusseisen" (where 0.06 per cent. of sulphur is too much for good material to contain, and where 0.04 per cent. is the maximum sulphur content allowed), it becomes necessary to provide some means of obtaining steel which shall contain less sulphur than the pig iron charged in the cupola; this pig or cupola mix has a maximum limit of 0.06 per cent. sulphur.

Fig. 3 seems to demonstrate that if the pig iron contains enough manganese to yield 0.75 per cent. to 1.00 per cent.

In the blows of group 1 (manganese in the cupola metal 0.425 per cent. or less) the average sulphur in the cupola mix was 0.0472 per cent., and in the steel 0.0548 per cent.; an addition of 16.2 per cent. of the sulphur in the pig. In group 2 (manganese 0.425 per cent. to 0.700 per cent.) the sulphur in the cupola mix had an average value of 0.0389 per cent. and the average sulphur in the steel was 0.0395 per cent.; an addition of 1.4 per cent. of the sulphur in the pig. In group 3 (manganese in the cupola metal over 0.700 per cent.) the average sulphur in the cupola mix was 0.0418 per cent. and in the steel 0.0273 per cent., an elimination of 58.5 per cent. of the sulphur in the pig.

Aluminum: Its Properties and Its Uses.

The following admirable summary on the properties of aluminum and on its uses has been prepared by Captain Alfred E. Hunt of Pittsburgh, for the 1892 volume of the "Mineral Resources of the United States," published by the United States Geological Survey:

Much erroneous data is still being published regarding the properties of aluminum. It is spoken of as having "no strength," that it "is as soft as lead," and that "its only peculiarity is its lightness," &c. A comparison of the actual results of tensile tests of aluminum shows these statements to be as markedly wrong as the other equally erroneous one that "aluminum is as strong as steel."

The properties of aluminum are:

1. Its relative lightness.
2. Its ability to resist corrosion as compared with many other metals, aluminum not being acted upon at all by sulphur fumes and being very much more slowly acted upon by moist atmosphere than most metals.
3. Its extreme malleability.
4. Its easy casting qualities.
5. Its high specific heat and heat conductivity.
6. Its relatively high electrical conductivity.
7. Its high tensile strength and elasticity, when weight for weight of the metal is compared with other metals, and especially when alloyed with a small percentage of silver, copper or other metals and properly worked by being rolled, hammered, drop forged or otherwise drawn out thereafter.
8. The valuable alloys it makes with many other metals.

These properties are here treated in relative order as given above:

1. The specific gravity of pure aluminum in the cast state is 2.58; in rolled bars of large section, 2.6; in very thin sheet which has been subjected to high compression under chilled rolls the specific gravity is increased as high as 2.7. The weight of a given bulk of cast aluminum being taken as 1, wrought iron is 2.90 times heavier; structural steel, 2.95 times heavier; copper, 3.60 times heavier; ordinary high brass, 3.45 times heavier; nickel, 3.50 times heavier; silver, 4 times heavier; lead, 4.80 times heavier; gold, 7.70 times heavier, and platinum, 8.60 times heavier. Most woods that would be used for structural purposes are about one-third as heavy as aluminum. A cubic inch of aluminum weighs 0.092 pound.

The metal has found many new uses within the last year where this property of lightness has been of peculiar advantage, as in the reciprocal parts of many forms of machinery where the momentum is to be overcome; for valves with air brakes and other forms of apparatus where the lightness of the metal is of importance. In many places where aluminum is too soft for the purpose this difficulty can be overcome by "bushing" the bearing parts. Where a stiff material is required aluminum can often be used by adopting properly designed sections and by using aluminum which has been hardened by alloying with a small percentage of other metals or by cold rolling, drop forging, or otherwise stiffening it. Aluminum can be cold rolled so as to be quite stiff, and the hardest rolled pure aluminum has about the temper of half hard brass. If the metal be alloyed with a small percentage of other metals

—as, for instance, copper—and then cold rolled, sheets can be gotten of a temper about as hard as hard brass.

2. There are two theories by which to account for the extreme stability of aluminum in the atmosphere. The first is that a clean surface of the metal speedily becomes coated with a very thin and impenetrable film of its own oxide, which thus protects it.

This does not explain the fact that when the metal is treated with acids which would necessarily remove the thin film of oxide upon its surface it does not seem to corrode more rapidly than before; but, on the contrary, if treated skillfully with certain acid solutions it seems to be more stable and non-tarnishable than when precautions have not been taken to clean off the coating of oxide from the surface of the aluminum.

The presence of a large percentage of silicon in aluminum materially detracts from its power to withstand corrosion due to atmospheric influence. Metal with 4 or 5 per cent. of silicon very soon collects a thick coating of oxide upon it. Aluminum has sometimes been produced in an alloyed state with metallic sodium. In such metal the sodium very soon oxidizes and washes out, leaving the aluminum spongy and porous and easily corrodible. Pure aluminum is practically not acted upon by either boiling water or steam. It is being used as a packing or gasket in steam connections to good advantage. Aluminum is not acted upon by carbonic acid or carbonic oxide or hydrogen sulphide at any temperature less than 600° F.

The metal, also, is not acted upon by most organic secretions or by most of the solutions used as germicides; and, due to this reason, it is receiving favor and considerable use for surgical instruments, suture wires, and places where subjected to carbolic acid or other antiseptic solutions.

Hydrochloric acid is the best solvent for aluminum. Strong solutions of the caustic alkalies readily dissolve it. Ammonia has a slight solvent action upon it.

Concentrated sulphuric acid dissolves aluminum on heating, with evolution of sulphurous acid gas. Dilute sulphuric acid acts only slowly on the metal. The presence of any chlorides in the solution, however, allows the metal to be rapidly decomposed. Nitric acid, either concentrated or dilute, has very little action on aluminum. Sulphur has no action on it at any temperature less than a red heat.

Sea water has very little effect upon aluminum. Strips of aluminum placed upon the sides of a wooden vessel corroded less than $\frac{1}{1000}$ inch after six months' exposure to sea water. Copper sheet similarly treated was corroded to a much greater extent than the aluminum. Unfortunately, however, for the advantageous use of aluminum as a sheathing for ships barnacles seem to thrive on it, as they do upon steel sheet, and the metal would have to be specially prepared to prevent the barnacles growing upon it in actual service.

For structural purposes under water, where metal is required, aluminum has been successfully used, and is standing the effects of time and corrosion much better than wrought iron or steel, or even cast iron, under similar conditions.

Aluminum is being used for shims upon masonry foundations, due to its non-corroding properties.

As yet aluminum sheet has received only a very small use for roofing, but the prospect is that there will

very soon be a very large use for the metal for this purpose, when it is furnished in sheet at a rate comparable in price to copper sheet similarly used. It is well in this connection, however, to note that aluminum stands very high in the series as an electro-positive metal, and that when subjected, in contact with any of the other metals, to solutions which are at all corrosive, the galvanic action established is considerable and is, as usual, at the expense of the electro-positive metal, the aluminum. This fact has to be borne in mind in designing new uses for aluminum in connection with other metals, to avoid contacts that will establish galvanic couples.

Polishing.—The best polish for aluminum is that called almeta polish, and consists of the following materials: Stearic acid, 1 part; fuller's earth, 4 parts; rotten stone, 6 parts, by weight; the whole powdered very finely and run through a bolting cloth sieve.

Aluminum will take and retain a very high polish, fully equal to that of silver. The truly distinctive and beautiful color of aluminum is best brought out in highly polished plate. Aluminum can be polished on a buffing wheel with rouge, like brass; and for polishing any considerable quantity of sheet, this, of course, is the most economical way. In the absence of special aluminum polishes, several of which are on sale, the ordinary cold brass polish will be found quite efficient if it is ground fine enough.

Scratch Brushing.—A steel scratch brush run at high speed will give a high polish to sand castings and will remove any yellowish streaks that may have been produced by too hot metal. A fine steel scratch brush gives a most beautiful finish to sheet metal or to articles manufactured from sheet. By this means a frosted appearance is given to the metal, which effect in many cases is equal to that given by a high polish.

Dipping and Pickling.—Remove the grease and dirt from the plates by dipping in benzine. To whiten the metal, leaving on the surface a beautiful white mat, the sheet should be first dipped in a strong solution of caustic potash. The solution should be strong enough to blacken the metal. The plates should then be dipped in a mixture of concentrated acids—two parts nitric acid, one part sulphuric acid; then in a solution of undiluted nitric acid; then in a mixture of vinegar and water, equal parts; then washed thoroughly in water and dried, as usual, in hot sawdust.

To polish, use a fine white polishing composition, rouge or tripoli, and a sheepskin or chamois skin buff, although it is often polished with an ordinary rag buff.

For burnishing, use a bloodstone or steel burnisher. For hand burnishing, use either a mixture of melted vaseline and kerosene oil or a solution composed of two tablespoonfuls of ground borax dissolved in about a quart of hot water, with a few drops of ammonia added.

For lathe work, the burnisher should wear upon the finger of his left hand a piece of cotton flannel, keeping it soaked with a mixture of melted vaseline and kerosene and bringing it in contact with the metal, supplying a constant lubricant. Very fine effects can be produced by first burnishing or polishing the metal and then stamping it in polished dies, showing unpolished figures in relief.

In spinning or turning aluminum plenty of oil should be used to prevent

the clogging of the tool and to make it cut smooth in the turning and to assist in the spinning.

3. Pure aluminum stands third in the order of malleability, being exceeded only by gold and silver. In ductility it stands seventh, being exceeded only by gold, silver, platinum, iron, very soft steel and copper. Sheets of aluminum are rolled down to 0.0005 inch in thickness and beaten into leaf nearly as thin as gold leaf.

Beaten aluminum leaf is now being used for decorative purposes, and notable examples of it are seen in the leading hotels of New York, and especially in the decoration of the Transportation Building at the World's Columbian Exposition. All the artistic work of the

Aluminum in thick sections is annealed by being heated in muffled furnaces to a temperature which will show a low red heat on a piece of iron or steel placed in the muffle, in the dark, which is a temperature of about 800° F. The metal should be allowed to cool gradually after being subjected to the annealing temperature.

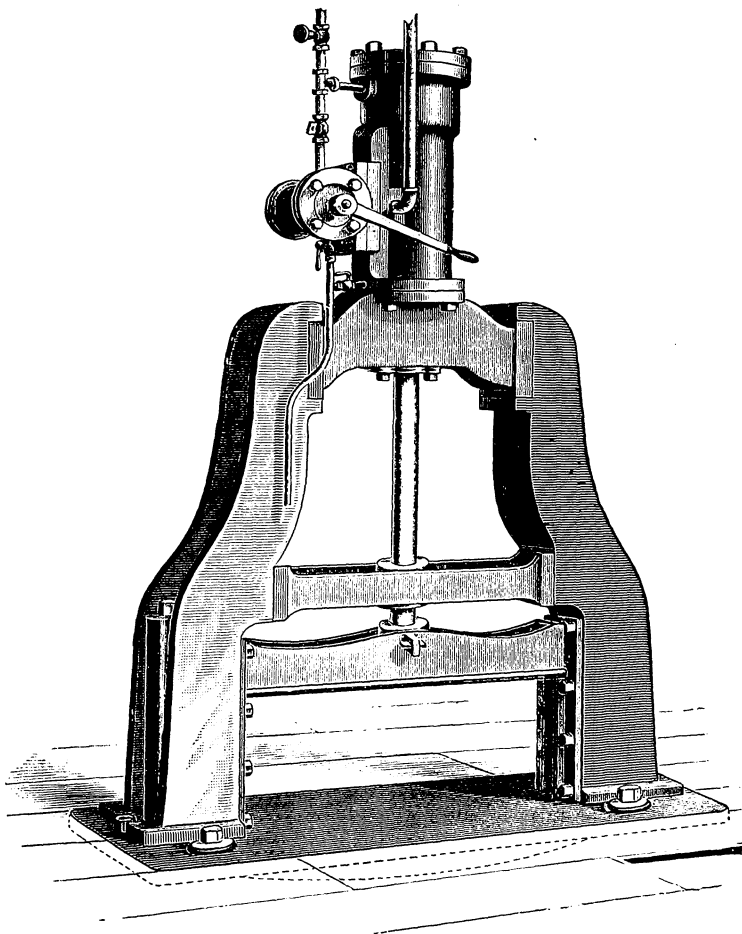
Aluminum has been rolled into tubes successfully in this country, but we are still behind the Germans in this matter, as by the Mannesmann process aluminum tubes have been made on a very large scale and as successfully as with other metals.

4. Sound castings of aluminum can be made in either dry or "green" sand molds or in metal "chills." Aluminum

The use of the metal in castings is now rapidly establishing one of the largest demands for it in the market.

The production of cast aluminum hollow ware has just been started as a new industry that will undoubtedly be successful. Aluminum tea kettles are now on the market, and aluminum coffee pots and tea pots will soon follow. Hollow ware castings have been successfully made in the form of tea kettles, with only $\frac{1}{8}$ inch thickness of metal in the walls of the kettle, which is a remarkable evidence of the good casting qualities of aluminum. Another advantage which may be incidentally spoken of here is that these castings are more malleable than those of any other metal. Thin castings of aluminum tea kettles have been hammered in and bent almost double before breaking. The Smith pressure casting process has been very successfully used for casting aluminum articles by the Passaic Art Casting Company, of Passaic, N. J. By this process the finest details of the engraving, chased and *repoussé* work are brought out in aluminum castings with a finish equal to that of electrotypes. Molds either of sand or of a liquid plaster of Paris composition are made in as flat a shape as possible, so that they may be piled on top of each other; the gates from each mold leading to a central sprue. The effective penetration of the molten aluminum to every part of the matrix is secured by the collection and temporary detention of the entire charge of molten metal in a suitable holder above the molds, where a prompt and continuous transfer of the molten metal from the bottom of the holder to the matrix cavities is obtained by the aid of increasing the pressure at the rear and decreasing the pressure in front of the advancing stream of molten metal by means of a piston covered with asbestos, which fits closely into the cylinder above the receiver for the molten metal, the mold itself being air tight and in connection with the vacuum tank of an air pump. A thin diaphragm of asbestos used to hold the molten metal in the receiver before it enters the mold is burst by the pressure placed upon the metal by the piston, allowing it to flow suddenly into every minute cavity of the mold. Extremely light and sharp aluminum castings, having a remarkable solidity and freedom from blow holes, are obtained by this process.

(To be concluded.)



THE WAIS & ROOS SHEET DOUBLER.

decoration of this building is made upon a base of thin beaten aluminum foil. Aluminum takes oil colors very kindly, and sheets, plaques and foil are now being largely used in art work as well as in decorations. The use of aluminum foil has almost altogether superseded, within the last two years, that of silver foil, which had been used for the same purpose. Aluminum has also been drawn down into the very finest sizes of wire. The metal is most malleable at a temperature of between 400° and 600° F., a temperature readily discerned by noting that the metal is hot enough to char the end of a pine stick when rubbed across its face. At this temperature the metal can be drawn down between rolls with nearly as much draft upon it as with heated steel.

Aluminum is capable, with frequent annealing, of being rolled or hammered down cold.

should not be heated in melting much beyond its melting point, for if superheated it absorbs occluded gas to such an extent as to make unsound ingots. This is especially shown if the ingots are subsequently to be rolled. In pouring great care should be taken not to occlude air in the molten metal as it is cast and as it rises in the molds. Due to its lightness and the difficulties of forcing the occluded gases to the surface in castings, it is wise to use large feeding gates and heavy risers or sinking heads to produce sound castings. The shrinkage of aluminum is a little more than that of ordinary brass, being $\frac{1}{4}$ inch to the foot. It should be melted in plumbago crucibles. The metal becomes molten at a temperature of 1120° F., according to the researches of Professor Roberts-Austin; 1800° F., according to Richards' work on aluminum.

The Wais & Roos Sheet Doublor.

In the ordinary method of doubling sheet iron by the use of the mallet a large amount of scrap is made, as the metal is very apt to shift in the hammering down. The machine shown—made by the Wais & Roos Punch and Shear Company of Cincinnati, Ohio—obviates this difficulty to a large extent, since one stroke is sufficient to do the work, whereas several strokes are necessary by the old method. By means of this machine a saving in scrap is effected, since it permits of closer adjustment. The machine is operated by steam, and is built both automatic and hand reversing. The valve can be very readily controlled, is adjusting and its construction renders it free from danger of breaking or getting out of order. This machine is built in two sizes—No. 1 is 40 inches in width, with 5 inch steam cylinder and 16 inches stroke, and No. 2 is 50 inches wide, with 6-inch cylinder and 18 inches stroke, each style having steam cushion.

Benner's Prophecy.

Undismayed by some very uncomfortable experiences during the past few years, when the promised boom failed to materialize, Samuel Benner has again ventured on prophecy. The following is the outlook for 1894, as printed in the latest edition of that curious and entertaining book, "Benner's Prophecies":

It is somewhat against the desires of the writer to predict calamity in the future business of this country; yet, however, I yield to the urgent demand from business men for my views.

We are now in the down cycle in trade and prices, as explained in this book.

In the forecast for 1892 it was remarked that general business would languish and low prices would prevail for the next six years.

After such disasters as have occurred in 1893 the inquiry is a most anxious one: What is the business outlook for 1894? My prediction is that hard times, poor trade, continued lower prices and general stagnation in our industries, will prevail all over this country throughout this year.

There will be a new and extraordinary business situation—a combination of adverse legislative enactments never before experienced in this country.

The repeal of the silver purchasing law leaves us squarely on the deadly gold basis.

There is no doubt of the Wilson tariff bill passing Congress and becoming a law, with some unimportant changes.

Gold basis with low tariff will be something new in trade conditions, and its effects will be to paralyze the whole country. It will mean the lowest depths of depression in all our industries.

Speculative booms in business are out of the question—no use to look for them. The discarding of the silver dollar as a money unit has killed all speculation. The price of silver bullion will eventually decline in the world's market, dragging down wheat, wool, cotton and all agricultural products.

It will be some satisfaction in these troublesome times to know that the greenback will save us from so great a calamity as the bursting of the Jackson paper money in 1837.

The hard times following that disaster spread a pall of bankruptcy over the whole land. Taxes could not be paid, and the greater part of the debts were settled by bankruptcy.

The greenback was our mainstay in the long down sweep of prices after the panic of 1873, after the Baring panic of 1890, and also after the late panic in 1893. We can rely on it after the coming commercial panic which is certain to follow the adoption of a low tariff.

No political party should ever be voted into power that would advocate the retirement of the greenback.

Now, at this time, we have no fears in regard to the soundness of our paper money; yet we are in a deplorable financial condition.

The demonetization of silver in 1873 continues to hang over the business outlook as a dark and threatening cloud.

This stealthy act was a crime against God and man. It was an unpardonable sin, and no atonement can ever be made for it; it has occasioned more loss to the agricultural, mining and industrial interests of this country than the costs of all the wars that have ever been

waged on this continent; it has occasioned more grief, sorrow and gloom than all other crimes; it has been the real cause of declining prices in lands, grain, wool, cotton, iron and all else, to lower figures than ever known; it is the main reason why that stagnation prevails in our industries to-day; it is the monster that has thrown an army of laborers out of employment—filled our cities with starving men—because there is no work for them to do.

It is evident that the money problem is predominant for depression in our business affairs, and it is a sad and doleful commentary upon the times that in this free and enlightened country—rich in all the bounties of nature, inexhaustible mines of coal, iron, gold and silver, boundless agricultural resources—that such disasters in business should have occurred as described, and all this under a high protective tariff.

If, with all that has happened in the past, when in possession of so favorable agricultural, manufacturing and mining advantages, with protection, what is to be expected as a result of the adoption of a free-trade and ad valorem low duty tariff, at this time, with silver demonetized?

The low duty tariffs have been shameful failures in this country. Whenever we have had a low tariff, the general Government became involved in debt, manufacturers were crippled, the people were impoverished, and labor was thrown out of work.

A low duty tariff will cause declining prices for labor and its productions, resulting in a lessened ability to pay debts. The gold we have will soon fly off to Europe to pay for goods we should manufacture ourselves.

When we had the low tariff in 1833, so empty was the Treasury that the President could not draw his salary. The tariff was reduced in 1857. In the following year there was a deficiency in the revenue, and the Government was compelled to borrow \$20,000,000.

The low tariff era from 1857 to 1861 was a dismal period in tariff history. The industries of this country were prostrated; the people were poor and in debt. These four years of low tariff bankrupted more iron furnaces and factories, caused more failures in business and reduced the laboring man to greater hardships and privations than ever before known.

With low tariff, on a gold basis, we can look forward to nothing else but an adjustment of prices to the low plane of foreign countries. The labor of this country will be forced down to the impoverished condition of labor in Europe.

What else can be expected but continued embarrassed business, bankrupted manufacturers, unemployed labor and ruined farmers?

We sound the note of warning. Hard times are coming, the sting of which will come to every man's home.

SAMUEL BENNER.

DUNDAS, OHIO, January 1, 1894.

F. B. Vandegrift & Co., customs brokers and forwarders, of this city and Philadelphia, have published in very convenient form the Wilson tariff bill. A particularly valuable feature of the pamphlet is an alphabetical list of articles showing the proposed duty. In the case of many articles not mentioned in the bill the rate is named which is based upon decisions of the courts, general appraisers and the Treasury Department.

San Francisco News.

The year closed has not been a disastrous one, but it has been certainly the dulllest year that it has ever been our province to record. The exchanges at the Clearing House fully bear witness to the character of the year, as they fell 15 per cent., or over \$120,000,000, short of those for 1892. The iron and hardware trade may be taken to be a fair average, a gauge, as it were, of the condition of things in general; and this percentage fairly represents the loss in these lines of trade for the year, and as their volume in San Francisco may be set in ordinary years at \$16,000,000 for the city, \$30,000,000 for the State and \$50,000,000 for the coast, the falling off represents in figures a loss of two and a half millions for the city, four and a half millions for the State and seven and a half millions for the coast.

This is, of course, a very serious loss, but no worse than has been experienced in any other part of the Union. The figures I have given, of course, relate to each and every department of the iron and steel trade, whether manufacturing or otherwise, as well as to those of the iron and steel trade proper. The causes of the dullness were the same as those prevailing in other parts of the United States, to wit, low prices for produce and the financial troubles that made themselves felt everywhere with more or less force.

In agricultural implements there was a restricted importation from Eastern manufacturing centers, but not so much as in other lines. During the spring, as the farmers expected a turn for the better in the market, they purchased rather freely; but later on, in the fall, when the promised boom in wheat did not come, they were very conservative and purchased but little. This was true of California made goods, as well as of Eastern ones. Our manufacturers at Stockton, Benecia and elsewhere, felt the pressure of the times as well as the importers, and the quantity of goods manufactured fell short of that for 1892.

The hardware trade proper showed very much diminished imports by rail but considerably larger ones by sea, both by way of the Isthmus and via Cape Horn; in fact, receipts of goods by sea were very great. It did not, however, make up for the loss by rail, though it would doubtless have exceeded it had it not been for the exceptionally dull times. There was, too, a much wider market opened for goods distributed from San Francisco because the sea route made the railroads bring down their rates to much lower figures. For instance, a way into Oregon was opened up to us by the competition of the Oregon Pacific, while the low rates of the Pacific Steamship Company opened up to us again the markets of Los Angeles and the South. This would have been a great advantage if there had been much of any business to be done, but these sections were badly affected by the financial troubles, especially Oregon, and the favorable rates to the South came too late to be of any substantial advantage. It is estimated that a saving of \$8,000,000 must have been effected to the consumers by the war of rates, and of this it is safe to say that at least \$1,000,000 must have gone into the pockets of the consumers of hardware. One result of the reduced freight rates was to lower the prices of stocks of goods already on hand, as they had to compete with those having the advan-

tage of the cheaper rates. Prices were thus driven down in many instances to bed rock—that is, the importer or jobber was satisfied if he got back a new dollar for an old one. Prices in some instances would have gone lower but that dealers had to get back what they had paid. There was no chance to advance prices. The conditions of the market have of late turned again in favor of the trade, as the Southern Pacific has reduced local rates all the way from 10 to 20 per cent. The same talk that has been prevalent for the past two years as to certain firms going out of the trade has been heard also during the closing months of the year, but without much probability of time vindicating its correctness.

The imports of iron have fallen conspicuously short of those of 1892 in all departments. Of pig iron the total imports have been 10,289 tons, including

The Tesla Electrical Oscillator.

In the lecture delivered before the Chicago Electrical Congress, Nikola Tesla first drew attention to the method and means which he had devised for the continuous production of alternating currents of constant period in which all rotating parts are avoided by the employment of his oscillating engine directly to the movement of the generating coil in the magnetic field.

The main reason why no engine heretofore has been capable of producing results of this nature is that it has been customary to connect with the reciprocating parts a heavy fly wheel or some equivalent rotary system of relatively very great inertia, or in other cases where no rotary system was employed, as in certain reciprocating engines or tools, no regard has been paid

alter the period of the mechanical vibration, although it may alter its amplitude. This condition may be readily secured by properly proportioning the self induction and capacity of the circuit, including the generator.

Mr. Tesla has, however, observed the further fact in connection with the use of such engines as a means for running a generator, that it is advantageous that the period of the engine and the natural period of electrical vibration of the generator should be the same, as in such case the best conditions for electrical resonance are established and the possibility of disturbing the period of mechanical vibrations is reduced to a minimum. Mr. Tesla has found that even if the theoretical conditions necessary for maintaining a constant period in the engine itself are not exactly maintained, still the engine and generator combined will vibrate at a constant period. Forex-

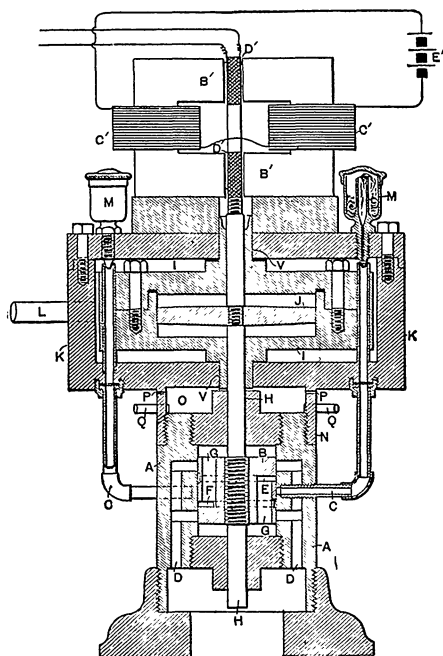


Fig. 1.

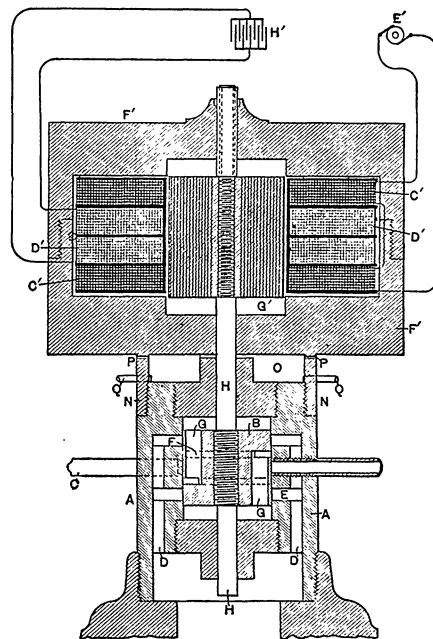


Fig. 2.

THE TESLA ELECTRICAL OSCILLATOR.

3538 tons of foreign and 6751 tons of Eastern, principally Alabama. We had only 5 tons of Oregon for the whole year, and none from Puget Sound. The total imports of 1892 were 14,567 tons of all sorts. There were 7374 tons of foreign in 1892, or more than twice as much as for the past year. It seems that the imports of foreign have been dwindling down to almost nothing, while those of Eastern have remained nearly the same. The imports of scrap have fallen off to only a fraction of what they used to be—305 tons for the whole year. We have lessened our stock very little, as there has been but a comparatively light business done by our foundries. One reason for the light importations of pig and other foreign iron was that importers were uncertain as to what would be done in the matter of the tariff. This will leave imports light for some time to come. The market was never lower than it has been during the greater part of 1893—\$18 to \$20 for American and \$22 to \$23 for English and Scotch. Should the new tariff be what is promised we may expect a revival in our foundry interests in 1894.

to the obtainment of the conditions essential to the end which Mr. Tesla had in view.

In applying the Tesla oscillator for the generation of currents of constant period certain conditions are encountered which must be taken into consideration in order to satisfactorily secure the desired result. When a conductor is moved in a magnetic field and a current caused to circulate therein, the electro magnetic reaction between it and the field might disturb the mechanical oscillation to such an extent as to throw it out of isochronism. This, for instance, might occur when the electro magnetic reaction is very great in comparison with the power of the engine, and there is a retardation of the current so that the electro magnetic reaction might have an effect similar to that which would result from a variation of the tension of the spring; but if the circuit of the generator be adjusted so that the phases of the electromotive force and current coincide in time, that is to say, when the current is not retarded, then the generator driven by the engine acts merely as a frictional resistance, and will not, as a rule,

ample, if instead of using in the engine an independent cylinder and plunger, as an air spring of practically constant rigidity, the piston may impinge upon air cushions at the ends of its own cylinder. Although the rigidity of such cushions or springs might be considerably affected and varied by the variations of pressure within the cylinder, still by combining with such an engine a generator which has a period of its own, approximately that of the engine, constant vibration may be maintained even through a considerable range of varying pressure, owing to the controlling action of the electro magnetic system.

Indeed, Mr. Tesla has even found that under certain conditions the influence of the electro magnetic system may be made so great as to entirely control the period of the mechanical vibration within wide limits of varying pressure. This is likely to occur in those instances where the power of the engine, while fully capable of maintaining a vibration once started, is not sufficient to change its rate.

The accompanying engraving, says the *Electrical Engineer*, from which we

quote, Fig. 1, is a sectional view of an oscillator fulfilling the conditions laid down above.

Referring to Fig. 1, A is the main cylinder, in which works a piston, B. Inlet ports, C C, pass through the sides of the cylinder opening at the middle and on opposite sides. Exhaust ports, D D, extend through the walls of the cylinder and are formed with branches that open into the interior of the cylinder on each side of the inlet ports and on opposite sides of the cylinder. The piston B has two circumferential grooves, E F, which communicate through openings, G, in the piston with the cylinder on opposite sides of the piston respectively.

The particular construction of the cylinder, the piston and the ports controlling it may be very much varied, and is not in itself material, except that in the special case under consideration it is desirable that all the ports, and more especially the exhaust ports, should be made very much larger than is usually the case, so that no force due to the action of the steam or compressed air will tend to retard or affect the return of the piston in either direction.

The piston B is secured to a piston rod, H, which works in suitable stuffing boxes in the heads of the cylinder A. This rod is prolonged on one side and extends through bearings, V, in a cylinder, I, mounted in line with the first, and within which is a disk or plunger, J, carried by the rod H. The cylinder I is without parts of any kind and is air tight except as a small leakage may occur through the bearings V, which experience has shown need not be fitted with any very considerable accuracy.

The cylinder I is surrounded by a jacket, K, which leaves an open space or chamber around it. The bearings V in the cylinder extend through the jacket to the outside air, and the chamber between the cylinder and jacket is made steam or air tight by a suitable packing. The main supply pipe, L, for steam or compressed air leads into this chamber, and the two pipes that lead to cylinder A run from this chamber, oil cups, M, being conveniently arranged to deliver oil into the pipes for lubricating the piston.

In the particular form of engine shown the jacket K, which contains the cylinder I, is provided with a flange by which it is screwed to the end of the cylinder A. A small chamber, O, is thus formed, which has air vents, P, in its sides and drip pipes, Q, leading out from it through which the oil which collects in it is carried off.

In the position of the parts shown, or when the piston is at the middle point of its stroke, the plunger J is at the center of the cylinder I and the air on both sides of the same is at the normal pressure of the outside atmosphere. If a source of steam or compressed air be then connected to the inlet ports C C of the cylinder A and a movement be imparted to the piston as by a sudden blow, the latter begins to reciprocate in the well known way.

The movements of the piston compress and rarefy the air in the cylinder I at opposite ends alternately. A forward stroke compresses the air ahead of the plunger J, which acts as a spring to return it; similarly on the back stroke the air is compressed on the opposite side of the plunger J and tends to drive it forward.

The compressions of the air in the cylinder I and the consequent loss of energy, due mainly to the imperfect elasticity of the air, give rise to a very

considerable amount of heat. This heat is utilized by conducting the steam or compressed air to the engine cylinder through the chamber formed by the jacket surrounding the air spring cylinder; the heat thus taken up and used to raise the temperature of the steam or air acting upon the piston is availed of to increase the efficiency of the engine.

In any given engine of this kind the normal pressure will produce a stroke of determined length, and this will be increased or diminished according to the increase of pressure above, or the reduction of pressure below, the normal. In constructing the apparatus proper allowance is made for a variation in the length of stroke by giving to the confining cylinder I of the air spring properly determined dimensions. The greater the pressure upon the piston, the higher will be the degree of compression of the air spring, and the consequent counteracting force upon the plunger.

The rate or period of reciprocation of the piston, however, is mainly determined by the rigidity of the air spring and the inertia of the moving system, and any period of oscillation within very wide limits may be secured by properly proportioning these factors, as by varying the dimensions of the air chamber, which is equivalent to varying the rigidity of the spring, or by adjusting the weight of the moving parts. These conditions are all readily determinable, and an engine constructed as above described maintains a perfectly uniform period through very wide limits of pressure.

The pressure of the air confined in the cylinder when the plunger I is in its central position will always be practically that of the surrounding atmosphere, for while the cylinder is so constructed as not to permit such sudden escape of air as to sensibly impair or modify the action of the air spring, there will still be a slow leakage of air into or out of it around the piston rod, according to the pressure therein, so that the pressure of the air on opposite sides of the plunger will always tend to remain at that of the outside atmosphere.

To the piston rod H is secured a coil, D, which, by the movements of the piston, is oscillated in the magnetic field produced by two magnets B' B' which may be permanent magnets or energized by coils C' C', connected with a source of continuous current, E'. The movement of the coil D' across the lines of force established by the magnets gives rise to alternating currents in the coil. These currents, if the period of mechanical oscillation be constant, will be of constant period.

In the case under consideration it is assumed as a necessary condition that the inertia of the movable element of the generator and the electro magnetic reaction which it exerts will not be of such a character as to materially disturb the action of the engine.

Fig. 2 is an example of a combination in which the engine is not of itself capable of determining entirely the period of oscillation, but in which the generator contributes to this end. In this figure the engine is the same as that shown in Fig. 1. The exterior air spring is, however, omitted and the air spaces at the ends of the cylinder A relied on for accomplishing the same purpose. As the pressure in these spaces is liable to variations from variations in the steam or gas used in impelling the piston they might affect the period of oscillation, and the conditions are not as stable and certain as in the

case of an engine constructed as in Fig. 1. But if the natural period of vibration of the electric system be made to approximately accord with the average period of the engine such tendencies to variation are very largely overcome and the engine will preserve its period even through a considerable range of variation of pressure.

The generator in this case is composed of a magnetic casing, F', in which a laminated core, G', secured to the piston rod H is caused to vibrate. Surrounding the plunger are two exciting coils, C' C', and one or more induced coils, D' D'. The coils C' C' are connected with a generator of continuous currents, E', and are wound to produce consequent poles in the core G'. Any movement of the latter will therefore shift the lines of force through coils D' D' and produce currents therein.

In the circuit of coils D' is shown a condenser, H'. By the use of a proper condenser the self induction of this circuit may be neutralized. Such a circuit will have a certain natural period of vibration, and, as this depends upon the capacity and self induction, the period may be varied to approximately accord with the period of the engine.

In case the power of the engine be comparatively small, as when the pressure is applied through a very small fraction of the total stroke, the electrical vibration will tend to control the period, and it is clear that if the character of such vibration be not very widely different from the average period of vibration of the engine under ordinary working conditions, that such control may be entirely adequate to produce the desired results.

National Iron Roofing Association.

The National Iron Roofing Association met in St. Louis on Thursday morning, at 10 o'clock, in the Southern Hotel, with President C. H. Conner in the chair.

The following delegates were present:

- T. C. Langenbach, Berger Mfg. Company, Canton, Ohio.
- C. Holbrook, Canton Steel Roofing Company, Canton, Ohio.
- G. H. Needham, Garry Iron & Steel Roofing Company, Cleveland, Ohio.
- J. A. Topping, Aetna-Standard Iron & Steel Company, Bridgeport, Ohio.
- James G. Battelle and James Hicks, Cincinnati Corrugating Company, Piqua, Ohio.
- A. L. Andrews, Globe Iron Roofing & Corrugating Company, Cincinnati, Ohio.
- H. P. Lloyd, and G. M. Verity, American Roofing Company, Cincinnati, Ohio.
- Chas. Aldrich, and R. B. Whittemore, Jr., American Roofing Company, St. Louis.
- R. J. Hyndman, W. G. Hyndman & Co., Cincinnati, Ohio.
- C. H. Conner, and E. H. Conner, Chas. H. Conner & Co., Louisville, Ky.
- R. B. Miller, Jas. A. Miller & Bro., Chicago, Ill.
- Alex. Glass, and E. C. Ewing, Wheeling Corrugating Company, Wheeling, W. Va.
- Gustav Miller, St. Louis Corrugating Company, St. Louis.
- E. E. Souther, and A. G. Souther, E. E. Souther & Bro., St. Louis.
- M. H. Crittenden, M. H. Crittenden & Son, Minneapolis, Minn.

E. C. Brainerd, Columbia Corrugating & Mfg. Company, Niles, Ohio, and Chicago, Ill.

The president's report was read and proved to be an interesting document. He reviewed the work of the past year and referred to the depressing effect which the panic had on general business during the last half of the year, and ventured the assertion that the iron roofing trade would compare favorably with any other line of business. He also made the statement that notwithstanding the innumerable failures which were recorded during the year 1893 not one roofing concern was included in the list. This is an excellent showing, and President Conner took occasion to congratulate the delegates on the excellent record made. He also recommended the adoption, with such changes as the members might desire to make, of the report of the Executive Committee, by which the new United States standard gauge is adopted and adjusted to the use of the iron and steel roofing manufacturers. He closed his address with the hope that a closer union and a more effective and beneficial organization would be the result of the meeting.

R. J. Hyndman, secretary and treasurer, then read the reports of his respective offices. Under the secretary's report he stated that three members had been added to the association since the last meeting, namely Chattanooga Steel Roofing Company, Chattanooga, Tenn.; Columbia Corrugating & Mfg. Company, Niles, Ohio, and Chicago, Ill., and O. K. Harry, Dallas, Texas. He reported that a correspondence had been kept up during the year with manufacturers outside of the association, and these accessions were the result of his labors.

As treasurer he reported a balance on hand, and that the association was free from debt.

J. G. Battelle, chairman of the Executive Committee in his report referred to the fact that the manufacturers of galvanized iron had already adopted the United States standard gauge, and urged the National Iron Roofing Association to do the same. At the October meeting a new price-list was compiled on painted roofing and siding to conform to the new United States gauge, which list Mr. Battelle stated was in the secretary's hands and would be submitted to the members for their final action.

The special Committee on Freight Rates, &c., reported that the effort to secure special classification on roofing tools did not succeed. On conductor pipes, elbows and fittings a reduction of one classification was secured. The general Freight Committee had nothing special to report.

The important business of the afternoon was the adoption of a scale of prices to conform with the United States standard gauge.

This measure met with the unanimous approval of all the delegates.

The election of officers for the ensuing year resulted in the choice of the following:

President, E. E. Souther, St. Louis.
Vice-president, T. C. Snyder, Canton, Ohio.

Secretary and treasurer, R. J. Hyndman.

The Executive Committee appointed by President Souther is as follows:

Charles Aldrich.
J. G. Battelle.
W. T. Graham.

The midsummer meeting will be held at Niagara Falls, and the next

annual meeting will be held in Cincinnati, on the second Thursday in January. Adjournment followed.

The evening was given over to the banquet tendered to the association by the St. Louis members at the Mercantile Club.

THE WEEK.

The annual report of the New York State Board of Railroad Commissioners for the fiscal year ending June 30, 1893, points to a constant increase in accidents at grade crossings, notwithstanding that the efficiency of railroad management is increasing. Eighty-six persons were killed at such crossings during the year. The total number killed on the railroads of New York State from all causes was 742, while the injured numbered 2888.

Barring the coldness of its climate, Vermont seems to be the place to live in these hard times. Ex Governor Stewart announces that there are no tramps, few out of employment and little or no destitution in the State up to date.

An excessive depth of snow, says a Dominion journal, will seriously hinder lumber operations in the Canadian provinces this winter. A similar complaint comes from the lumbermen of Maine.

Of the 1500 men employed out of the relief fund on work in the park at Pittsburgh over one-half are native Americans.

The city authorities of Cleveland, Ohio, sold \$300,000 of 4 per cent. municipal bonds to procure funds for improving the parks in order to furnish work for a large number of the unemployed.

The California orange crop was seriously injured by a hard frost which struck the citrus belt of the State early in last week.

Warning is given that a considerable quantity of counterfeit money has been put in circulation recently in the Eastern States, consisting of quarter and half dollars, bearing date 1893.

The latest advices from Australia speak of great distress among the unemployed in that country. To relieve the depression South Australia is locating a co-operative community, aided by the Government, on a million acres of land in Kangaroo Island, which will be occupied at starting by 1000 unemployed. Some of the other colonial governments are also granting tracts of land for a similar purpose.

While the year 1892 was one of disturbance and disaster in so many countries, it appears to have smiled on Ireland. The London *Times* says that last year was one of the most peaceful and prosperous of the century in the Emerald Isle. Since 1826 there has been no better agricultural season, and the people have never been freer from distress.

The Pittsburgh *Press* has prepared an approximate estimate of the number of men, in the main iron workers, employed in the Pittsburgh district. Out of 56,956 men employed by 68 firms reported when working full, only 26,413 are at work.

Dun's Review, in a carefully prepared table, gives the result of an inquiry made by them into the extent of the financial depression of 1892, as

affecting the leading industries of the country. The exhibit—although, of course, not absolutely accurate, as many leading houses in the various trades failed to respond—serves to show approximately the vast injury done to the business of the United States by the panic and uncertainty of last year. In the iron and steel trade, for example, 147 reports were received, which, in the aggregate, show a decline of 39.8 per cent. Of these replies, 86 from the Eastern trade give an average decline of 32.9 per cent.; 37 from the West, 57.1 per cent., and 24 from the South, 56.0 per cent. of falling off. In the hardware trade, as represented in 66 reports, the decline was not nearly so pronounced, being in the aggregate but 18.5 per cent., as compared with the business of 1892. Territorially the respective declines were as follows: East, 17.4 per cent.; West, 25.2 per cent., and South, 14.8 per cent. Other leading industries reported on showed the following declines:

| | Per cent. |
|---------------------------|-----------|
| Textile manufactures..... | 41.0 |
| Dry goods..... | 19.0 |
| Boots and shoes..... | 18.6 |
| Clothing..... | 12.3 |
| Hats..... | 18.6 |
| Furniture..... | 27.2 |

The only prominent industry reporting that shows an advance in business over 1892 was groceries, and that only to the extent of one-tenth of 1 per cent.

The Danbury hat strike still continues and some of the factory owners are preparing to leave that hat making center for other locations.

A man has been arrested in New York charged with stealing electric power to turn the wheels of a bicycle in Madison Square Garden. He claims that electric power cannot be made the subject of larceny under the present statutes.

Among the novelties of a local nature at the Midwinter Fair, at San Francisco, are a miners' camp of 49 men, a gold mine, into which visitors can descend, and a Pacific deep diver and shark hunter. The exhibits of the mineral and agricultural wealth of California are said to be on a very imposing scale.

Owing to too heavy shipments to Cincinnati, Pittsburgh coal is cheaper at that center than at home.

An important find of good coal is reported in Mendocino County, Cal., where mines are about to be developed.

One of the largest real estate transactions on record was consummated a few days ago, in the final transfer by the State of Florida to the Atlantic and Gulf Coast Canal and Okeechobee Land Company of 2,000,000 acres of rich land in the heart of the semi-tropical region of Florida. The transfer was the outcome of a contract entered into between the State of Florida and Hamilton Disston, of the well-known firm of Philadelphia sawmakers, who is president of the above named corporation, by which the latter undertook to reclaim the vast tract of country in the vicinity of Lake Okeechobee, theretofore subject to constant inundations. The work has been successfully completed after 12 years of hard work and a large expenditure of money; and a continuous waterway of 350 miles has been opened from Kissimmee City to the Gulf of Mexico, which will be of the greatest benefit to Florida. The grant to Mr. Disston's company in recompense for these services places about 3125 square miles of land at their disposal.

The Iron Age

New York Thursday January 18, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
-GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
-RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

A New Basis of Wages.

The manufacturers of pottery and the makers of collars and cuffs have laid down a line of action with regard to wages which seems logically unsailable. Assuming that duties on imported manufactured articles should be applied solely for the benefit of workmen, the proposition to pay foreign schedules of wages in the same trades, plus American duties, appears eminently fair. The charge has been made, in and out of season, that manufacturers have appropriated to their own advantage the greater part of the benefits conferred upon domestic industries through the operation of duties, and that the workmen have received very meager results from this Governmental interference with the freedom of trade. It is a familiar theme with labor agitators, who have in the past dwelt with bitterness on the wrongs suffered by their followers in not being made equal participants in the profits derived from high duties. Whenever a reduction in wages was asked for by a manufacturer, it was held up as a proof of the workman's defenseless condition when attacked by his employer's rapacity. Political parties have sought to make capital for themselves by adopting platforms advocating Protection to labor to the extent of the difference in wages paid in the same industries here and abroad.

The advocates of the new basis of wages for American workmen have not deliberately argued themselves into the adoption of such a policy. It is not with them a theory that has gradually taken root and developed into a movement for exploitation. It has suddenly been forced on them by the provisions of the Wilson tariff bill, making the readjustment of wages a vital necessity if they desire to continue in the business in which they have invested their capital and from which they have hitherto derived support. The potters expect the keenest competition from the English potters, and therefore propose to pay English wages plus duties. The collar and cuff makers find their competitors in Germany, and make German wages their basis. If employers in other lines follow the example thus laid down, they will take wages paid in the several countries from which they have reason to apprehend the severest rivalry in American markets, and will prepare corresponding wages schedules for their workmen. In the past, our

consular agencies have reported foreign labor schedules to be used merely for political purposes. In the future such reports may have a much more practical bearing, because on them may depend a rise or fall in the wages of vast numbers of working people in the United States. The lower the wages paid in competing countries, the lower would wages be forced in the United States. It is by no means a pleasant picture to hold up before an American workman, that his wages should be regulated by the worst paid labor in any country in the world, but is that not the direct solution of the problem to be forced on the country by the new dispensation, according to the prophet crying in the wilderness of West Virginia?

It may be claimed that trades unions will prevent the introduction of such a system of regulating American wages. They cannot do it. The impotence of unions to interfere with revolutions brought about by natural causes has been very thoroughly demonstrated during the past two years, perhaps more thoroughly than ever before in the history of this country. When reductions in wages are absolutely necessary to enable a plant to run, and workmen must choose between half a loaf and no bread, they may require some time for deliberation, but eventually they will take the half loaf. Even in the iron trade, in which the strongest unions have hitherto flourished, because of the high wages earned, and consequently the independent financial condition of most of the workmen, the power of the organizations has been badly broken by the hard times and scarcity of work, so that English or Belgian wages plus duties is by no means only a nightmare, if the Wilson bill as at present drawn should be enacted into law.

Under such circumstances the protection to manufacturers would be the freight on foreign goods. This is in most instances a very small matter in comparison with the value of the articles. But when a manufacturer offers to give the benefit of the entire duty to his workmen, and to depend upon the freight for his own protection, he takes a very bold step. He shows that he is ready to compete with the world at large if he is given his labor at the world's rate, relying for the most part on his possible advantage of location near his customers and on his enterprise in either meeting their wishes in styles and qualities or else in making labor saving devices still more effective in decreasing costs of production. We have now come to a point in our industrial progress when workmen are brought face to face with foreign labor schedules. More interest will be taken in the subject than in the past, when such figures were merely made the basis of theoretical abstractions. American manufacturers will give up no part of their home market to foreign goods until every resource is exhausted. In this fight labor will either willingly or unwillingly take a

very conspicuous part, and it should not complain if it is given whatever benefit may be derived from duties.

Chicago Elevated Railroads.

The Mayor of Chicago has signed the ordinance authorizing the Northwestern Elevated Railroad Company to build a system of elevated railroad from the business center of the city to the northern limits. This project is reported to have the backing of a number of wealthy citizens, who propose to push the work as rapidly as possible. The main line will be 12 miles in length, but only 6 must be built within the first three years. Important branches will be constructed as feeders. The Lake street elevated also has a franchise for the same territory, and is actively at work surveying routes preliminary to acquiring right of way. Authority was given the Board of Directors at the recent annual stockholders' meeting to proceed with construction. Considerable preliminary work must be done by both roads before they are in shape to purchase material, but it is confidently expected that contracts will be made before spring opens, as the builders desire to push work this summer, and also wish to get the advantage of the low prices now ruling on iron and steel.

Investigations are being made with a view to employing electric propulsion instead of steam. Other Chicago elevated roads are also looking into the advantages of electricity. It is understood that the Metropolitan, now rapidly approaching completion, has suspended orders given for steam engines until data can be secured in regard to electricity. The South Side elevated will at an early day undertake the construction of a 2-mile branch, and may perhaps build more.

A good example of the recklessness and ignorance displayed by writers on the iron trade is furnished by the following table which the *Evening Post* reprints from a pamphlet issued by the New York Reform Club:

Present Prices at the Works, F.O.B.

| | America. | England. |
|----------------------------------|----------|--------------------------------------|
| Furnace coke (2,000 pounds). | \$1.05 | \$1.93 |
| Counellsville (2,240 pounds). | 1.16 | Durham coke... 8.76 |
| Southern iron.. | 7.50 | Cleveland iron No. 3 11 13 |
| Bessemer iron.. | 10 75 | Bessemer..... 23.70 |
| Bar iron, \$1.30 | | Staffordshire bar iron..... 26.12 |
| per cwt..... | 29.12 | Billets at Bar- row..... 20.66 |
| Steel billets.... | 16.75 | |

The American prices are fairly accurate, but the English values are woefully out of the way. Durham coke is selling delivered at Teeside blast furnaces, Middlesborough district, at 13/6, or \$3.27, per ton, this high price being due to the temporary scarcity created by the recent coal strikes. We do not know what "Bessemer" at \$23.70 is supposed to be. If, as must be assumed, it is Bessemer pig, then the startling fact is presented that the

pig is dearer than the steel which is made from it. As a matter of fact, Bessemer pig is selling at Middlesborough at 43/, say \$10.41. It is true that No. 3 Southern Foundry has sold at \$7.50 at furnace. But it takes \$4 to get it to market. It would be just as fair to compare the price of wheat on a Dakota farm with that of that grain in an English barn. Billets equal in quality to our wire billets are selling at £3. 10/ at works, which is equal to \$17. German mills, however, who took the bulk of our trade in recent years, are glad to sell for the American market at £3, f.o.b. works, or say \$14.50, which compares with \$18.25 to \$18.50 at Eastern Pennsylvania mill. The latter is a fair basis of comparison and not the price at Pittsburgh.

An Improvement in the Business Situation.

There can be no doubt that the tide is turning in the business affairs of this country. From every quarter come indications of a slight improvement, although thus far the iron and metal trades have participated but little in it. Reports from some financial circles prove that money is again beginning to flow into investment channels. It is a well-known fact that municipal and kindred bonds are finding quite a ready sale at fair prices. The effect has already been witnessed in the larger demand for pumping machinery, cast iron pipe and supplies for water works extensions.

A somewhat surprising fact brought out by a number of interviews with the presidents of some of the leading savings banks of New York is that money is flowing back into those institutions. In spite of the widespread distress among the working classes the deposits during December and thus far in January have exceeded the withdrawals, and in some of the large institutions from one-half to two-thirds of the loss of deposits during the runs of the summer have been recovered. Of course, this merely means that the more thrifty among savings banks depositors have regained courage, and are tired of losing interest.

Although much cannot be expected for a long time to come from foreign investors, who have been shocked again by such happenings as the Atchison receivership, yet it is true that houses with European connections have had some orders lately for bonds, which have been unsalable for many months.

Manufacturers in the staple lines also note increasing inquiry and are doing a better business. No one claims that the normal demand has even been approached, but the shrinkage has stopped and tentative, timid expansion has begun. No one is sanguine as to the rate of progress which we may attain in the next few months. There are too many adverse influences at work to admit of rapid recovery. But after the long period of trial and

disaster it is joyful tidings that the business situation is improving, slight though that recovery may be.

Iron manufacturers are generally convinced that the actions of certain concerns in the trade have needlessly pounded values to the present extraordinary level of prices. Has it occurred to buyers and sellers alike how sudden the recovery is likely to be when the ruthless raiders withdraw even temporarily from the field?

The statistics of the production of copper collected by John Stanton throw interesting light on the position of that metal during 1893. Production plus the imports of foreign pyrites, mattes and bars figures up about 323,000,000 pounds, against 354,828,257 in 1892, so that there has been some falling off. Against this the exports have expanded greatly. This amounted to 180,000,000 pounds, against 96,500,000 pounds in 1892, and counting in re-exports of foreign material, left available for home consumption, neglecting stocks which are unknown, about 141,000,000 pounds. The available supply, exclusive of stocks, was estimated at 256,000,000 pounds in 1892, and 177,000,000 pounds in 1891, which proves that the copper trade suffered as severely, so far as the restriction of demand is concerned, as the crude iron industry. What disasters would have befallen it but for the outlet in Europe it is not difficult to conceive.

An event of considerable importance to the Northwest is the resumption of the Marine Bank, commonly known as the Mitchell Bank, at Milwaukee. The failure of this great institution last summer did more to shatter confidence in the stability of the banks of that section than any other event. It had stood the storms of a half century and was deemed impregnable, having behind it what were popularly supposed to be unlimited resources. When it collapsed there is little wonder that depositors in smaller banks clamored for the immediate payment of their accounts. The great majority stood the shock safely, and since then business has slowly improved until now the conditions are favorable for the reorganization of the most conspicuous victim in the Northwest of the financial depression. The repairing of the ravages of the panic thus proceeds, even though slowly, and times are shown to be steadily growing better.

The Johnson Project.—In the course of his famous speech in the House of Representatives, Hon. T. Johnson of Ohio, who is connected with the Johnson Company at Johnstown, Pa., announced that an extension of their plant is in contemplation. A. J. Moxham, president of the company, has authorized the following statement: "It is our intention to erect a large converting plant and an automatic rail mill in connection with the one we have now. We further intend to increase the capacity of our shape mill by adding an additional engine to our finishing mill, which will enable us to roll rails from

90 to 100 feet long, instead of 60 feet, as at present. A further additional mill is contemplated, but not yet definitely settled upon. It has not yet been decided whether we will erect blast furnaces at this time or later. It is not yet settled that the works will be erected in Johnstown. A committee representing the Johnson Company is now traveling for the purpose of investigating the advantages of the various steel centers of the country. But should some other point than Johnstown be selected it will not mean a total removal of the Johnstown plant, at least at present. Our rolling mill would probably go at once, but the switch works and foundries in all likelihood will remain where they are."

Sales Regardless of Cost.

A Western iron broker has received the following letter from a large Pennsylvania rolling mill company, which he sends to us with the request that it be printed in order to show the attitude of the trade on some matters that are now being discussed with more or less interest:

DEAR SIR: We have your favor of 3d and note same. If you receive the order in question we would fill it of annealed sheets at the price you offer, viz., —, New York and commission, which is less than cost, in all probability. However, these are no times to consider manufacturers' profits. If the sheriff can be stood off it is perhaps all that can be hoped for, especially with some mills which are forcing these ruinous prices without bringing any more business.

Carnegie's patriotic move before he shook the dust of America off his feet, in issuing orders to take orders from the four quarters of the earth at any price offered, was, in our opinion, about the silliest thing that any man of even average intelligence could have done. In giving his own men employment he may be the direct cause of throwing thousands of other worthy men out of employment in less favored districts who will become objects of charity. His action, in our opinion, is more mercenary than charitable.

Riter & Conley of Pittsburgh have recently completed for the Westinghouse Air Brake Company, at Wilmerding, Pa., one of the largest steel smoke stacks in the country. The masonry pedestal stands 21 feet above the general level of the ground; the stack proper is 200 feet high; i. e., 221 feet in all. The clear diameter is 10 feet; there are 9 inches of brick lining, which makes the casing or shell 11 feet 6 inches in diameter. The lower 15 feet of the shell is made up of vertical tapered sheets, the bottom being spread out to 17 feet in diameter, resting on a heavy base plate. The stack is anchored by eight bars, 2½ inches diameter, built into the masonry to a depth of 21 feet, and connected to the stack by steel brackets 4 feet high.

The next meeting of the Western Foundrymen's Association will take place on Wednesday, January 24, at 7.30 p.m., in rooms 702-703 Temple Court Building, Chicago. A paper on "The Use of Coke in Foundries" will be read by C. K. Pittman of Chicago, and it is expected that several of the more prominent coke and foundrymen of the West will be present and will take part in the discussion.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., January 16, 1894.

After the parliamentary maneuvers which delayed taking up the bill to "reduce taxation and to provide revenue for the Government and for other purposes," the majority, on January 8, having at length obtained a quorum, Chairman Wilson of the Committee on Ways and Means opened the general debate in Committee of the Whole under the arrangements which were then agreed to. There were 47 speeches made under the rule for general debate during the day and night sessions. The discussion under the five-minute rule for amendment having commenced yesterday, that stage of the discussion will be continued until January 29.

The speeches which attracted most attention, however, were those of Wilson, Haines of New York on the shirt, collar and cuff industry of Troy; Breckinridge of Kentucky, Springer of Illinois, "Tom" Johnson of Ohio on steel rails and the tariff on that class of manufactures, Harter, Jerry Simpson and his shoddy overcoat and Bourke Cockran. The latter speech was very much admired by certain parties, but the analytically disposed members thought it was more of an essay on the abstract proposition than a practical presentation of the Wilson bill, for which he had no friendly feeling, but for which he would vote.

The minority speeches which carried the most weight for public consumption against the measure were those of Burrows, Payne, Dalzell and Grosvenor.

The speech of Mr. Reed will be held in reserve, according to the present arrangement, for a finish.

The five-minute speeches and amendments by day and general debate by night will now run for two weeks.

The majority of the Senate Committee on Finance have changed their tactics in regard to their consideration of the House bill on tariff revision. It was originally proposed to grant a limited number of hearings by lumping different classes of industries.

This plan has been abandoned and a broadcast issue of circulars of inquiry is now not only proposed but will be inaugurated this week. About 400,000 of these circulars are being printed and will be sent to at least 200,000 separate addresses, which have been obtained through the bureaus of the Census and Labor.

This movement through circulars is based upon the method pursued in 1845 under Secretary Walker, 1882 through the Tariff Commission and 1885 by Secretary Manning. The following is the form of circular which will be sent:

TO MANUFACTURERS.

1. Name of party and character of manufacture.
2. Location of plant.
3. Capital invested.
4. When established.
5. Amount of production annually since.
6. If running less than full time during past two years, when and why?
7. Rate of ad valorem or specific duty to place domestic producers on footing with foreign. Why?
8. What reduction of cost of production if duty reduced one-third?
9. Prices, domestic wholesale price, 1884, 1890, 1892.
10. Has there been increased competition in your line during past four years?

11. Do you desire specific or ad valorem duty?

12. Comparison of goods produced by you with 1892.

13. Tendency of wages.

14. Cost of living of workmen; items.

15. On construction of existing law.

16. Comparison of price of living in two years.

17. Cause of present depression and what should correct it?

18. Raw materials of your manufacture.

19. Are your goods luxuries or necessities?

20. Rate of interest on loans.

21. Effect of immigration on your business.

22. Proportion of skilled labor you employ.

23. How will you meet any reduction on the goods you manufacture?

24. Number and class of employees and wages paid.

25. Hours of work per week employed.

26. Do foreign articles of like kind enter into competition, and how much?

27. What proportion of your product exported, and do you realize less price for it than from domestic consumption?

28. Has cost of manufacture increased or decreased since 1883?

29. Has it been in materials or labor?

30. Have selling prices increased or decreased since 1890?

31. Amount of agricultural productions of the country consumed in your manufacture.

32. Component materials used in your manufacture upon which you pay a specific or an ad valorem duty. Give rates.

33. If your raw material free would there be any necessity for a customs duty on the manufactured product?

34. State wholesale prices your manufactures 1884, 1890, 1892, and comparison with 1892.

35. What changes on existing rates do you suggest?

It may also be interesting to manufacturers to know the nature of the information to be asked from other sources.

THE CIRCULARS OF INQUIRY TO FARMERS.—Ask the character of product; whether foreign products compete; effect of reduction of duty on imports; extent of exports from State; what competition do such exports meet abroad; effect manufacturing industries on prices; have living expenses increased or decreased during the past four years; do the present duties benefit people engaged in growing agricultural products; do you favor free sugar?

TO LABOR ORGANIZATIONS.—Name industry or trade represented; membership. Have wages, hours or production been curtailed in your district within 12 months? If depressed, what remedy? Have expenditures of families of workmen been lessened? Give a comparative statement of wages for five years. What would be the effect of a reduction of duties from your standpoint? To what extent has immigration affected the workmen in this country?

TO COLLECTORS OF CUSTOMS.—On the working of the existing tariff in their respective districts.

TO IMPORTERS.—Asking name of parties and character of goods imported; cost of manufacture, rates of duty, comparison of rates under act of 1890 and corresponding specific rates; conditions necessary to make the United States an exporting country; comparison of price of local market and same for export and

price in American market; commissions; comparison of conditions of workmen in both countries; whether protection or free trade exists in country of manufacture; what European country most prosperous in past 12 months and causes.

TO BOARDS OF TRADE.—Asking statistics of trade, wages, employment, gross value and net profits, condition of trade for five years past, effect of tariff changes proposed, causes of existing depression, and views on change from specific to ad valorem duty.

TO NEWSPAPERS.—Inclosing a set of interrogations on tariff rates and causes of depression, and asking publicity.

It is probable that the iron and steel interests will be represented in some comprehensive form in these replies. Without discouraging these important interests in their efforts to stem the tide, the judgment of the most sagacious men in the Senate is that the bill when brought to a final vote will pass in whatever form it may have taken in the meantime.

The board on the test of 11½-inch curved nickel steel plate for Monadnock's barrette representing Group 12 Carnegie Steel Company, as a result of test of plate January 9, 1894, at the Indian Head proving ground, which failed to pass acceptance test, rejected the whole group which it represented.

The dimensions of plate were: Length, 11 feet on the curved surface; 5 feet ¾ inch wide, and 11½ inches thick; weight, 24,540 pounds, 10.95 tons; mounted on oak backing 36 inches thick at the middle, 24 inches thick at the edges, secured by 14 armor bolts, and secured to four 18 inch uprights of target structure. Gun used, 30-caliber 8-inch B. L. R. No. 15. Carriage, C. P. Recoil No. 18. Distance of plate from muzzle of gun, 330 feet; line of fire, normal to middle of plate.

Round 1: Charge, 83 pounds; striking velocity, 1631 foot seconds; striking energy, 4615 tons; energy per ton of plate, 421.5 feet; ratio as compared with energy necessary just to perforate wrought iron of same thickness, 1: 46. Shell, Holtzer 8 inches A. P.; weight, 250 pounds. Struck plate at an angle of impact 11° from normal, 24 inches from top and 38 inches from left edge; penetrated 12 inches in line of impact, turning first away from normal then toward it; rebounded, breaking into three principal pieces 60 to 200 feet in front of plate.

Interior shot hole much broken, back bulge broken off, backing being exposed. A through crack from ¾ inch to 1 inch wide from impact to top of plate. Another smaller diagonally upward toward top of plate separated a triangular shaped piece weighing about ½ ton. Another crack 1 inch wide ran to left downward. Three bolts broken off and driven to rear. After this impact about 9 tons of the plate remained whole.

Round 2: Charge, 73½ pounds; striking velocity, 1534 foot seconds; energy, 4083 feet per ton of plate; ratio for wrought iron same thickness, 1: 29. Shell same as first. Struck 27½ inches from top, 64½ inches from right edge and 28 inches from impact No. 1. Penetration, 11½ inches. Shell fell entire in front of plate. Shot hole broken and through. This impact broke off all upper left hand corner of plate, weighing 2 tons, opening a through crack ¾ inch to 1 inch wide to impact 1; a through crack ½ inch to ¼ inch wide from this impact to bottom of plate, and another through

crack toward right edge of plate to surface crack at right edge. The photograph accompanying the report illustrate the effects of these impacts.

PERSONAL.

H. L. Hollis and F. E. Emmerton have formed a partnership under the firm name of Hollis & Emmerton to continue the business of analytical chemists, metallurgical and mining engineers formerly carried on by H. L. Hollis & Co. Mr. Emmerton takes charge of the Cleveland office and laboratory, Perry-Payne Building, and Mr. Hollis remains at the office heretofore occupied by him in the Rookery Building, Chicago.

Jeremiah Head, an English consulting engineer and metallurgist, well known to a good many Americans, has transferred his headquarters from Middlesbrough to 47 Victoria street, Westminster, London, and has taken his son, Archibald P. Head, into partnership, the style of the new firm being Jeremiah Head & Son.

F. Lehman of Naylor & Co., New York, has returned from Europe.

Edward H. Sanborn has severed his connection with the *Manufacturers' Record* of Baltimore, of which he was editor for two years past.

Alexander Hay, one of the London partners of the firm of Naylor & Co., is now in this country.

Eckley B. Coxe has been appointed by Governor Pattison of Pennsylvania a member of the Geological Survey Commission.

Wm. Metcalf, of the Crescent Steel Company of Pittsburgh, accompanied by his family, left for Florida recently to spend the winter.

David Williams, publisher of *The Iron Age*, starts for the Mediterranean to-day.

G. E. Drummond has delivered an elaborate address on the Canadian iron industry before the recent meeting of the Quebec Mining Association at Montreal.

C. Seymour Dutton, for some years general agent of Wm. Tod & Co., Youngstown, Ohio, has resigned his position, taking effect on January 1. Mr. Dutton will continue to give some attention to such of the unfinished business of this firm as has been under his immediate control, until it can be otherwise assumed, without detriment to the interests of the firm. As yet Mr. Dutton has made no other business alliance and may prefer to enjoy a short rest before commencing active work again.

David Hitchcock, formerly vice-president of the National Tube Works Company, McKeesport, Pa., has been elected president, vice E. W. Converse, deceased. E. C. Converse, general manager, will assume the duties of vice-president. E. W. Converse, Jr., has been added to the Board of Directors.

Joseph T. Ryerson & Son, plate merchants, have placed a unique sign in position against the exterior of their warehouse on Milwaukee avenue, near Lake street, Chicago. It is claimed to be the largest boiler head in the world, being the one that was exhibited at the World's Fair by Fried. Krupp of Essen, Germany. It is 153 inches in diameter,

1½ inches thick and weighs 7800 pounds. It was presented to the present owners by the manufacturer, and is being utilized as a sign, a suitable inscription being painted on it. The largest boiler head made on this side of the Atlantic is stated to be 120 inches in diameter.

CORRESPONDENCE.

The Pittsburgh Reduction Company.

To the Editor: I note in your issue of January 4 a statement that "Negotiations are pending at Lockport, N. Y., for the consolidation of the Cowles Electric Smelting & Aluminum Company of that city and the big concern at Pittsburgh, and the removal of the conjoint plant to Niagara Falls, where it is proposed to build the largest aluminum electric smelting factory in the world. It is understood from good authorities that the stockholders of both the Cowles aluminum and the Pittsburgh aluminum companies have consented to the consolidation and removal to Niagara Falls."

This statement is not correct, so far as it relates to any consolidation of the Pittsburgh Reduction Company, manufacturers of aluminum, and the Cowles Electric Smelting & Aluminum Company. There are no negotiations pending for any such consolidation between the two companies, nor have there been, nor will there likely be. The further portion of the statement, that the Pittsburgh Reduction Company are enlarging their works by an additional plant at Niagara Falls, however, is true.

Very respectfully,
THE PITTSBURGH REDUCTION COMPANY,
ALFRED E. HUNT, President.
PITTSBURGH, PA., January 11, 1894.

The Cowles Electric Smelting & Aluminum Company.

To the Editor: In a late issue of your paper we notice an item stating that the Cowles Electric Smelting & Aluminum Company and the Pittsburgh Reduction Company had consolidated. We wish to deny this statement, as the two companies have not consolidated, nor are there any negotiations to that effect pending. Neither are we expecting to move our plant to Niagara Falls. Our works at Lockport are still in operation, and we are prepared to furnish aluminum and our different alloys as heretofore.

THE COWLES ELECTRIC SMELTING & ALUMINUM COMPANY.
LOCKPORT, N. Y., January 13, 1894.

The Hubbard Co-operative Rolling Mill.—The details of arrangements made for starting the plant of The Hubbard Iron Company, Hubbard, Ohio, are now made public. An organization known as the Hubbard Co-operative Iron Company have leased the works and commenced operations under the following conditions: William F. Bonnell, president of the company, has been appointed trustee by the Hubbard Banking Company, who have loaned the new company \$7500 to purchase raw material and other supplies, the loan being secured by mortgage on the finished and unfinished stock. This fund is the only working capital of the concern, but it will be increased by an amount equal to the first two weeks' earnings of the workmen and a percentage every pay day thereafter. Every

workman thus becomes a stockholder. The directors, six in number, are all men actively employed in the mill, excepting the president, who takes charge of the office and of the business, assisted by George C. Wilson of Hubbard. An auditing committee will be appointed, and the affairs of the company will be conducted upon strict business principles. Mr. Bonnell is well known among buyers of bar iron, &c., and will have the advantage of a valuable connection. Employment will be furnished to about 135 men. There are 23 puddling furnaces in the mill.

OBITUARY.

FREDERICK SCHWEICKERT.

Frederick Schweickert, a hardware merchant of Cheyenne, Wyo., recently died at San Diego, Cal., where he was staying for the benefit of his health, which had for a considerable period been failing. Mr. Schweickert was about 66 years of age. He was born in Germany and came to America while a young man and engaged in business in Louisville, Ky. Subsequently Mr. Schweickert moved to Nebraska, and shortly after to Cheyenne, where in 1867 he opened a Hardware store, the first in that place.

HENRY S. ECKERT.

Henry S. Eckert of Reading, Pa., died on January 10, aged 63 years. Mr. Eckert had been ailing for some time from a complication of ailments. Mr. Eckert was the son of the late Isaac Eckert, who, like his son, was a banker and iron manufacturer. The father was president of the Farmers' National Bank for upward of 40 years, and at his death in 1873 his son, Henry S., succeeded him and held the position up to his decease.

He was interested in a number of business enterprises. With his brother, George B. Eckert, under the firm name of Eckert & Bro., he conducted the anthracite blast furnaces in Reading known as the Henry Clay. He was for a number of years president of the Eastern Pennsylvania Pig Iron Association, and was interested in industries in Topton, Lebanon and other places. At the last annual meeting of the Philadelphia & Reading Company, in Philadelphia, he was elected a director of the East Pennsylvania Railroad. He was one of the trustees of the Penn Mutual Life Insurance Company of Philadelphia and a vice-president of the Reading Board of Trade.

Governor Penoyer of Oregon recently put himself on record as stating that two-thirds of the wage earners of the State are out of employment. The Portland Chamber of Commerce, after investigating the subject, has, however, publicly controverted the Governor's assertion. They find that only a small proportion of the workers are idle, and characterize the chief executive's statement as misleading and injurious to the State.

The Berlin Iron Bridge Company of East Berlin, Conn., are putting the roof on a building for the United States Government at Fort Wadsworth, N. Y. The building is 41 feet wide and 231 feet long, the roof being made entirely of iron—iron trusses covered with corrugated iron.

Test of Wire Glass.

At Newark last Tuesday an interesting test was made of wire glass by C. S. Weber & Co. of 415 Broadway, N. Y., sole agents for the American Wire Glass Mfg. Company of Tacony, Pa. In one side of a brick building 7 x 4½ feet inside and 10 feet high was inserted a window consisting of a single pane of wire glass 20 x 84 inches. In the second side was a window 28 x 84 inches and composed of three panes, supported at their meeting edges by iron bars. The third window was 34 x 84 inches and composed of four panes whose meeting edges were unprotected. The roof of the building was of sheet iron having a hole in the center. In the fourth side of the building was a small door. An intensely hot fire of tar barrels was started within the structure and in a short time the glass was red hot, when a stream of water was thrown on the three windows. The glass cracked in every direction, but in no case did a piece fall out, the network of wire in the glass preventing this. Neither was there any indication of warping. The test was an unusually severe one and demonstrated that fine wire imbedded in the glass perfectly serves the purpose of holding the glass in position under the most trying circumstances and when it is broken in every part.

According to the estimate of the Director of the United States Mint the production of gold throughout the world for the year 1893 was \$150,000,000, the largest for any single year in history. The most remarkable growth of output is recorded from the Witwatersrandt region of South Africa, which has advanced from a production below \$15,000,000 in 1891 to \$31,000,000 for 1893. The United States shows an increase of \$2,000,000 in her gold output for the year, or \$35,000,000 in all. Of this amount Colorado's increase touches \$1,800,000.

The British Admiralty have decided to abandon the use on the new battle ships of 67-ton guns. The principal armament of the new vessels will be 50-ton guns mounted in barbets and so arranged that they can be loaded and trained by hand if the hydraulic power gets out of gear. The "Magnificent" and "Majestic," now under construction, will be the first ships so armed.

"Mill Construction" is the title of an excellent pamphlet, containing what we suppose was an address before the New England Cotton Manufacturers' Association, by Edward Atkinson and his son William Atkinson of Boston. In it Mr. Atkinson describes and illustrates with drawings his mill construction with self supporting frame. He commends a timber and plank structure in preference to brick.

The Queen & Crescent route has issued a new ratesheet on cast iron pipe from Southern to Northern points.

The annual meeting of the American Society of Civil Engineers is now in progress in this city.

An international exhibition, under the auspices of the Government, is to be held at Hobart, the capital town of Tasmania. It will be opened November 15, 1894, and will last for six

months. Information as to the character and scope of the exhibition can be obtained either from the Exhibition Committee, Hobart, Tasmania, or from the committee's London office, 5 Victoria street, Westminster, S. W.

MANUFACTURING.

Iron and Steel.

The Andrews & Hitchcock Iron Company, Youngstown, Ohio, proprietors of the Hubbard Furnaces, at Hubbard, Ohio, have given notice to their employees of a reduction in wages of 10 per cent., to take effect on the 16th inst. All appearances indicate that the men will accept the reduction, but in case they do not, the Hubbard Furnaces will be closed until there is an improvement in the pig iron business. The firm report sales of pig iron as being very slow, and they have quite a stock piled up in their yards.

In regard to the judgment recently obtained by the Chapin Mining Company, at Cleveland, Ohio, for \$40,024.69 against the Youngstown Steel Company, Youngstown, Ohio, we are advised that the dispute between these two firms arose over certain guarantees in a contract made by them, and by a misunderstanding of the attorneys of the Ohio Steel Company in Cleveland judgment by default was had. On the 9th inst. a check was sent to the Chapin Mining Company settling their account against the Ohio Steel Company to that date.

The Top Mill department of the Wheeling Steel & Iron Company, at Wheeling, W. Va., was put in operation last week, the product being iron and steel sheets. As yet the Wheeling Steel Works and the Benwood Iron Works of this firm, located at Benwood, have not resumed operation, but may be started up during this month.

The Hubbard Co-operative Iron Company have leased from the Mahoning Valley Iron Company the mill at Hubbard, Ohio. The organization is strictly co-operative. During the first three months the men will leave 50 per cent. of their wages in the general fund to be used in creating a capital. They have elected William F. Bonnell, president; James Simcox, vice-president; Isaac Green, treasurer; George C. Wilson, secretary. All financial and executive matters are intrusted to the president, while the practical operations of the mill will rest with a board of six managers, three of whom will be on the night turn and three on the day turn. Muck iron will be made at first, but it is proposed to start the finishing mills in due time. This co-operative venture will be regarded with much interest by manufacturers and workmen elsewhere.

The Union Iron Works of Los Angeles, Cal., are furnishing the iron work and boilers for the new rolling mill now building at that place. They have facilities for executing heavy work of all kinds.

Summitville, midway between Marion and Anderson, in Indiana, is striving hard to secure the new tin plate works projected by I. L. Morris and his associates. A large bonus is to be raised and the Gas Center Land Company have agreed to give the tin plate company the proceeds of the sale of 300 lots. It is claimed that the plant will be larger than that of the American Tin Plate Company at Ellwood.

The City Council of Birmingham, Ala., have resolved to request the State Legislature to change the city boundary lines so as to leave the property of the Birmingham Rolling Mill outside the city limits. This will reduce the taxation on the property and is hoped to influence the owners to put the plant in operation at an early day. It has been idle for a long time.

The contract has been let to the Laramie Rolling Mills to furnish the angle bars which will be used with the 26,000 tons of steel rails for which the receivers of the Union Pacific have contracted with the Pueblo Steel Works.

It is reported that the Round Mountain Furnace in Alabama, which has been idle for two years, will be started up shortly by L. S. Colyar, well-known in Southern iron circles.

A second reduction of 10 per cent. has been made in wages of the employees of the Paige Tube Company, Warren, Ohio. This firm employ when in operation to full

capacity about 425 men, and the reduction has practically been accepted by all of them. The plant of this firm is now idle, but is expected to resume operations within a week or two.

Last week the puddlers employed in the Sligo Rolling Mills of Phillips, Nimick & Co., at Pittsburgh, were notified of a reduction in boiling from \$4.75 to \$4 per ton. It is stated that the men will refuse to accept the reduction.

The sheriff was recently given two executions on judgments against the Marshallton Iron Works, at Marshallton, Del. A judgment of the Newport National Bank is for \$15,500, and one for Mrs. Elizabeth Bringham is for \$38,278. The mill is 50 years old.

The Chicago Tire & Spring Works, whose plant is at Melrose, Ill., have recently secured large orders for car couplers and springs which will keep those departments well employed for at least 60 days. Tire orders are not plentiful, but the tire mill is not altogether without work.

The entire plant of the Mahoning Valley Iron Company, at Youngstown, Ohio, with the exception of the 12-inch mill and the 18-inch and 24-inch plate mills, was in operation last week.

After an idleness of some months the blast furnace of the Norton Iron Company, at Ashland, Ky., has again resumed operations. The product of this furnace is Bessemer iron, and is used in the Bessemer steel plant of the Ashland Steel Company, at Ashland, Ky.

The Scottdale Iron & Steel Company, Limited, Scottsdale, Pa., manufacturers of iron and steel sheets, are adding two new sheet mills to their equipment and buildings to cover same. The addition of these two new mills require the erection of two additional sheet heating, two bar heating and one annealing furnace, which are now under construction. This firm are also putting in one of Warren Webster & Co.'s feed water heaters and purifiers of 1500 horse-power. The excavating has been completed and the materials are now on the ground for the foundations. New foundations are also being put in under the large sheet mill engine and fly pit wheels, and new wrought iron shaft is being added to one of the fly wheels to replace an old one. Other necessary repairs are also being made.

John A. Potter, general manager of the Cleveland Steel Company of Cleveland, Ohio, announces that that company have purchased the entire plant of the Britton Iron & Steel Company of Cleveland, who were manufacturers of plates, black and galvanized sheets, both iron and steel. They have closed down the entire plant for the purpose of remodeling and replacing the old facilities with the latest improved methods for the manufacture of sheet steel in all its branches, and are now erecting a steel melting department in connection with the works.

The sheet mill plant of the Ellwood Steel Company, Ellwood, Pa., was sold last week at assignee's sale for \$33,500, the purchase being made by A. W. Brown, vice president and general manager Cambridge Iron & Steel Company, Cambridge, Ohio, acting in the interests of the stockholders. These works consist of four sheet mills without sheet bar mill. The buildings are made of steel and every part of the machinery is new. Wm. Tod & Co., Youngstown, Ohio, furnished the engine, which is geared to run two trains of rolls, one from each side. The roll trains were furnished by the Leechburg Foundry & Machine Company, Leechburg, Pa. The plant is equipped throughout with every modern convenience, annealing furnaces of recent design and all necessary facilities. It is stated that operations will commence in a few weeks.

At Rockwood, Tenn., the Roane Iron Company have blown in their newly remodeled furnace, which is practically a new stack. The other stack will probably also be remodeled and modernized.

Investigation proves that there are good grounds for the report that sheet mills will be built at Canton, Ohio. The active people in the enterprise are a number of former employees of Kirkpatrick & Co., Leechburg, Pa., who were recently locked out. An organization has been formed and arrangements made with the Canton Board of Trade to locate at that point. E. L. Burchfield is secretary of the new company. It is expected that contracts will be placed about the 20th of this month. The fact that the iron and steel roofing concerns consume annually about 7000 tons of black

and galvanized light sheets was an important factor in deciding the location. The new plant will consist of two sheet mills and a sheet bar mill and will cost when completed about \$50,000.

The name of the South Milwaukee (Wis.) Malleable Iron Works has been changed to the Milwaukee Malleable Iron Company, and the capital stock increased from \$50,000 to \$100,000. It is stated that the company will erect a larger and greatly improved plant as soon as a location is decided upon.

It is stated that the Missouri Furnace Company of St. Louis will start one of their blast furnaces at an early date. Both stacks have been idle since July.

The Norton Iron Works, Ashland, Ky., have resumed operations in their puddling department and nail mills, and it is expected that the run will last six months. Employment will be furnished for about 600 men.

Coleman & Brock, Lebanon, Pa., are hastening the repairs on one of their blast furnaces with the view to putting it in blast by February 1.

Most of the striking employees of the Bessemer works of the Colorado Fuel & Iron Company, at South Pueblo, Col., have signed the scale and the prospects are that the works will start up at once.

At the annual meeting of the stockholders of the Andrews & Hitchcock Iron Company, operating the Hubbard Furnace, at Hubbard, Ohio, held in Youngstown last week, the following directors were elected, being the same as last year, with the exception of Mrs. C. H. Andrews, who takes the place of her deceased husband: Mrs. C. H. Andrews, John A. Logan, Jr., Upson A. Andrews, W. J. Hitchcock, Frank Hitchcock and W. J. Hitchcock, Jr. The directors organized by electing W. J. Hitchcock, president; John A. Logan, vice-president; Frank Hitchcock, secretary and treasurer. These are the same as last year.

The Union Drawn Steel Company, Beaver Falls, Pa., announce that their business for 1893 was considerably larger than for any previous year in their history.

The employees of the Girard Iron Company, operating Mattie Furnace, at Girard, Ohio, have agreed to accept a reduction of 10 per cent. in wages.

The blast furnace employees of the Struthers Furnace Company, at Struthers, Ohio, have agreed to accept a 10 per cent. reduction in wages in preference to having the furnace closed down and be thrown out of employment.

For some time past the Brown, Bonnell Iron Company, Youngstown, Ohio, have had under consideration the question of erecting a new blast furnace to take the place of the Falcon stack, which was recently dismantled. Within a short time several informal meetings of the officials of the above concern have been held, and the conclusion has been reached not to take any steps looking to the building of this furnace during this year. The low prices ruling for pig iron and the depression in the iron trade are the principal causes of the delay in the execution of this enterprise.

Machinery.

The Rosedale Foundry Company of Allegheny, Pa., have been granted a charter of incorporation with a capital of \$50,000. The directors are Mary P. Irwin, David L. Evans and Charles E. Riddle of Allegheny, and J. H. White of Pittsburgh.

The Westinghouse interests, at Pittsburgh, through Geo. Westinghouse, Jr., chairman, contributed \$10,000 toward the relief of the poor in Pittsburgh last week. The concerns comprising the Westinghouse interests are: The Westinghouse Electric and Manufacturing Company, Westinghouse Air Brake Company, Philadelphia Natural Gas Company, Westinghouse Machine Company, Union Switch and Signal Company, Fuel, Gas and Manufacturing Company and the Allegheny County Light Company.

The adjourned annual meeting of the stockholders of the Westinghouse Machine Company was held in Pittsburgh last week, and the following directors were elected: George Westinghouse, Jr., H. H. Westinghouse, John Caldwell, E. E. Keller and D. E. Jackman. The officers elected were: George Westinghouse, Jr., president; E. E. Keller, vice-president and manager; D. E. Jackman, secretary and treasurer, and T. L. Brown, assistant secretary and treasurer. Mr. Keller taking the place of Ralph Baggeley. The rapid extension of electric

plants wherein the engine and dynamo are combined into one structure is expected to lead to more active co-operation in the future between the Westinghouse Machine Company and the Westinghouse Electric and Manufacturing Company. It is stated that very considerable economies will be effected in the construction by the adoption of this policy. The net profits of the Westinghouse Machine Company for 1893 are stated to have been \$90,000.

The Standard Iron Works of San Diego, Cal., have recently established a branch at Phoenix, Arizona. Mining machinery, engines and agricultural implements are manufactured at both places, while the San Diego works carry on an important marine business.

The Norwalk Foundry & Machine Company of Norwalk, Ohio, are building a new foundry. The burning of the foundry of Higgins & Co. at that place about a month since left the town without a foundry, which is a serious inconvenience to other local industrial establishments.

L. C. Trent & Co., manufacturers of and dealers in mining machinery, have removed their offices to the Dooly Block, 206 South-west Temple street, Salt Lake City. They are vigorous competitors for machinery contracts to be placed in that section.

The Winona Mfg. Company of Winona, Minn., have been incorporated. The capital stock is \$100,000. The products are to be agricultural implements, castings, tools and machinery.

The Bass Foundry & Machine Works, at Fort Wayne, Ind., are building a Bass improved Corliss engine for the People's Mills, at Van Wert, Ohio.

Michael Burns is rebuilding the Phoenix Foundry, at Leavenworth, Kan., which was partially destroyed by fire last summer. His former partner, Joseph Behee, has withdrawn from the firm.

The Pratt & Cady Company, Hartford, Conn., having recently enlarged their foundry and equipped it with latest appliances for the economical production of fine castings, announce that they are prepared to turn out castings in iron, brass, composition, bronze, aluminum, &c. This department of the business is in charge of William A. Harris, who has been identified with the foundry business of New England for a number of years.

The F. L. Gaylord Company of Ansonia, Conn., advise us that they are doing considerable business in aluminum and manganese bronze castings for journal bearings, pinions, pump valves, crank pins, &c. They are also receiving many orders for pure aluminum castings.

The machine shops of the Pusey & Jones Company, at Wilmington, Del., which have been shut down for nearly two months, will start up shortly.

Theo. Hiertz & Son, St. Louis, Mo., manufacturers of Nonpareil anti-friction metal, report a fairly active trade since the opening of the year. Their December trade was the largest month in the history of their business. Their metal is particularly adapted for all machinery bearings, and the manufacturers claim that for high speed and crushing weight it has no equal. They also make a full line of Babbitt metals, solder, lead seals, electrotype and stereotype metals.

Charles P. Willard made an assignment in the County Court at Chicago last week to W. Scofield, as assignee. Assets were scheduled at \$100,000 and liabilities at \$50,000. Under the firm name of C. P. Willard & Co. Mr. Willard has conducted for some years a large iron foundry and boat building establishment at Dominick street and the North Branch. A large number of the steam launches used at the World's Fair were built by the firm. The assets consist mainly of valuable machinery used in the business.

J. B. German, formerly vice-president and manager of the Philadelphia Machinery & Supply Company of Philadelphia, has commenced business at 133-137 North Seventh street, in that city, under the name or style of the Quaker City Machinery & Supply Company. Besides handling a general line of engines, steam pumps and boilers, he will deal in steel rails, second hand machinery, railway, machinists' rolling mill and mine supplies of every description.

The Vulcan Iron Works, at Winnipeg, Man., have closed down for a period probably of ten weeks. The cause is attributed to the scarcity of work. Improvements and repairs will be made during the idleness of the works.

The machine and repair shops of the Erie Railroad Company in Jersey City, N. J., have been burned. The loss approximates \$100,000. It is said that the company will rebuild on the old site.

The Norwalk Foundry & Machine Company of Norwalk, Ohio, will build and operate a foundry in connection with their present business.

Fox & Son of 1936 North Twenty-third street, Philadelphia, will erect a one-story brick foundry building, 36 x 120 feet in size.

The Winona Mfg. Company, capitalized at \$100,000, have been incorporated at St. Paul, Minn., for the purpose of manufacturing tools, machinery and agricultural implements.

George C. Howard has resumed active control of his foundry and machine shops at 17 South Eighteenth street, Philadelphia, lately run by a company under the name or style of the Howard Foundry & Machine Works. Mr. Howard will in future carry on his business under the name of the Geo. C. Howard Foundry & Machine Works, and will continue to build the machinery and elevators with which his name has been connected so many years.

T. B. Burchfield, lately with E. C. Shaw & Co., dealers in engines, boilers and machinery, Philadelphia, has gone into business for himself at 55 North Seventh street, in that city. He proposes to deal in engineers' and steam fitters' supplies of all kinds, boilers and engines. He has secured the agency for the Lloyd & Sterett engines for Eastern Pennsylvania, and will also push the sales of the products of the Harrisburg Boiler & Mfg. Company, at Harrisburg, Pa.

The case of McClure & Amsler of Pittsburgh against the Roanoke Iron Company of Roanoke, Va., has been decided in favor of the plaintiffs for \$24,319.34, with interest thereon from January 1, 1891. The case grew out of the building of the West End Furnace, the contract for which was let to the plaintiffs. In the final settlement the company denied the claim of the firm on the ground that the work was defective and not up to the contract.

The Ashcroft Mfg. Company of Bridgeport, Conn., have notified their employees of a general reduction in wages ranging from 10 to 20 per cent.

The Cleveland City Forge & Iron Company, Cleveland, Ohio, have ready for shipment to Montgomery, Ala., two cotton press links, which are claimed to be the largest ever made. They are 25 feet long and 8½ feet wide, inside, and weigh 28 tons. This firm recently shipped several carloads of heavy steel forgings to the Sandwich Islands. The output of the Cleveland City Forge & Iron Company at the present time does not amount to more than 15 per cent. of their capacity.

Hardware.

The manufacturing department of Morley Bros., Saginaw, Mich., in which a large quantity of handles for lumbering tools was stored, was damaged by fire on the 9th inst. to the extent of several thousand dollars. The loss is fully covered by insurance.

The Franklin Brass & Bronze Company, Derby, Conn., will start up in about a week, giving employment to about 200 men.

Notice of another cut down in wages was posted in the wire drawing and packing rooms of the mills of the Washburn & Moen Mfg. Company, Worcester, Mass., on the 5th inst. The reduction in the wire drawing department will amount to from 25 to 65 cents per day, and affects 300 men who get from \$1.50 to \$2 a day, and who were affected by a cut down several weeks ago. In the packing room department the reduction is 10 per cent. and affects about 100 men at work on day rates. The reductions will go into effect on the 19th inst.

It is reported that there are good prospects for a resumption of work at the Western File Works, Beaver Falls, Pa. The plant in operation will employ about 400 men.

The stockholders of the Denver Hardware Mfg. Company, Denver, Col., held their annual meeting on the 4th inst. The following persons were elected directors for the ensuing year: W. N. Byers, R. A. Gutsch,

D. N. Hanson, Jr., W. A. Hall, J. F. Daubenberger, Frank N. Briggs and G. B. Townsend. The new board organized by electing W. N. Byers, president; Frank N. Briggs, vice-president and general manager, and R. A. Gutsch, secretary and treasurer.

The employees of the Portchester Bolt and Nut Company, Portchester, N. Y., have sent a petition to Congressman Ryan of that district protesting against the passage of the Wilson bill. The petition bears 450 signatures.

The factory of the Winsted Edge Tool Works, Winsted, Conn., resumed operations on the 8th inst. The plant has been idle for several months.

The steady increase in the business of Slaymaker, Barry & Co., Lancaster, Pa., has made a larger plant necessary, and an addition will soon be made to the factory.

Maltby, Henley & Co., Rocky Hill, Conn., started up their works on January 8.

A readjustment of the scale of wages at the plant of Sargent & Co., New Haven, Conn., has been made, with a reduction of 10 per cent. There does not appear to be any probability of a strike resulting from the reduction. The factory will continue to run on the eight hours a day schedule.

The factory of R. T. Torkelson & Co., Worcester, Mass., is running with a full complement of hands, but on reduced time. They are manufacturers of a low priced hammerless double shot gun.

Among new corporations in Michigan is the Watervale Mfg. Company of Watervale, capital stock \$75,000.

The American Wire Nail Company of Anderson, Ind., have resumed operations. The wages of the employees in the wire department have suffered another reduction, in this instance of 7 to 10 per cent.

The wire nail factory of the Salem Wire Nail Company, at Salem, Ohio, which closed down on December 31 for inventory and repairs, resumed operations on Monday morning, the 8th inst. Stocks of wire nails are reported as being very light, and with this concern were 50 per cent. lighter at inventory time than at any similar period during the past five years.

The Ohio Crude Petroleum Oil Stove Company, Ironton, Ohio, have been incorporated, with a capital stock of \$200,000. The incorporators are J. D. Foster, C. A. Hammel, W. M. Kerr, H. A. Marting and Louis E. Marting. W. M. Kerr is president of the company, H. A. Marting, vice-president; Louis E. Marting, treasurer; J. D. Foster, secretary and general manager, and C. A. Hammel, assistant manager. The company have been organized to manufacture the oil heating and cooking stoves recently patented by Messrs. Foster and Hammel.

The employees of the Consolidated Steel & Wire Company, at Braddock, Pa., have suffered a reduction in wages ranging from 10 to 32 per cent. The 200 wire drawers were reduced 32 per cent., amounting to \$1.10 per day. They will now receive 5½ cents per 100 pounds of wire. The cut in wages of other employees averages about 10 per cent.

Miscellaneous.

The Kansas Zinc Mining & Smelting Company, at Girard, Kansas, have just completed a four-block plant, two blocks of which are now in operation. The other two will start some time this month.

The Clinton Bridge & Iron Company of Clinton, Iowa, are securing county contracts in Iowa for the construction of road bridges, but very low prices are being made.

Among new Illinois corporations are the Memphis Car & Foundry Company, at Litchfield; stock \$600,000; incorporators, Calvin F. Collins, Henry H. Brach, John B. W. Amsden, John M. Marris and Louis C. Haynes. This is the company who will succeed the Litchfield Car & Foundry Company in the ownership of the works now being removed to Memphis, Tenn.

The wheel foundry of the Michigan Peninsula Car Works, at Detroit, Mich., has been started with a small force of workmen after five months of idleness. The managers hope to increase the force, but that will depend on the orders received for cars.

The recent agitation in the matter of bringing the works of the Bath Iron Company from Bath, Me., to New London, Conn., has terminated in the shipbuilding company setting forth propositions for the city of New London to accept.

The Iron and Metal Trades.

There are unmistakable signs, faint though they may be, of improvement in the Iron trade. There is more inquiry and more business is being done, though it must be confessed that in the majority of cases it is at the sacrifice of values. Still, every one understands that no hardening of prices can come until we begin to approach normal consumption.

We are far from that yet, but there is some encouragement in noting that the demand is growing. It may be true that this is delusive, because orders deferred in December are now being given out. We are inclined to believe that many consumers have reached the point when they must replenish stocks. As is natural, this crops up first among those staples which are distributed in the smallest quantities to the largest number of buyers. Thus the whole range of the Wire trade is reported as experiencing a very large demand for this season of the year.

We believe that the trade is concentrating its attention altogether too much upon the terrible condition of prices and is not watching closely enough the volume of the demand.

Nothing important has developed in the Ore situation, no large transactions being reported. It is understood, however, that meetings of the leading Mesaba interests are being held in this city.

Billets have sold down to \$15 75, Pittsburgh, and are offered on that basis, but conspicuous concerns west and east of the Smoky City have entered the arena and are crowding back the invaders. Chicago, Cleveland and Central and Eastern Pennsylvania display a determination to hold their own.

Rolling mill products produced from cheap Billets are following down the raw material. Wire Rods are selling in Western Pennsylvania at \$23.50, although buyers figure that the cost is not over \$6.50 over the cost of Billets.

Steel Bars are selling at a shade under 1.20¢ at Western mill. Beams have reached 1.35¢ and Tank Plate 1.20¢. The Newport News order for 1500 tons of Plates for the Government ships was taken by a Western mill at a very low price, contingent, however, upon the purchase of a round block of Steel Rails by an allied interest.

There is not much Structural work actually being closed, but there is quite a quantity in sight. Leading authorities among the Architectural Iron workers report that cheap money is likely to lead to considerable improving of choice realty in our leading cities.

Some pretty good contracts for Cast Iron Pipe have been given out in the last four weeks in different parts of the country. The Standard Gas Light Company bought upward of 5000 tons. Brockton and Boston are in the market for like quantities, and several Northwestern cities have placed moderate orders. Prices, however, have been very low.

An order for 3½ miles of 8-inch Wrought Pipe has produced a record breaking price in Pittsburgh.

Some fair Rail orders have been given to an Eastern mill, but as yet little has been heard concerning a good accumulation of orders at the West.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., January 16, 1894.

Newspaper reports of improvement in the Iron and Steel trade certainly cannot apply to this vicinity. There may perhaps be less complaining than usual because people are getting used to dullness and unremunerative prices, but as for improvement, it is not to be found. Nevertheless we are getting toward it, and there is a pretty distinct feeling that those who have survived so long will manage to pull through, although a definite turn for the better may yet be a considerable distance in the future. Consumption is increasing a little—very little, so far—but preparations for starting up are being made in various directions, and while there are no big orders anywhere, every one that starts does something to help others start. To state the case correctly, it may be said that the suspension of work during last month has caused a slight accumulation of orders everywhere; some can run a full week, some two weeks, some for a still longer time, but the continuance of work is still largely contingent upon what orders may come in during the next two or three weeks. The strongest proof that business is not improving is that prices are weak, and in some cases lower, while in no case can it be claimed that they are firmer. The trade are beginning to be more hopeful, however, and careful observers are prepared to see a change in the situation, but as we said before, it has not come yet. The disturbing feature is the reckless and useless cutting in prices by the Western mills. It does not increase the volume of business by a single ton, and if it is (as many well informed people believe) to make an excuse for forcing further reductions in labor, it will probably act like a "boomerang" and strike somewhere rather unexpectedly. Be that as it may, it is obvious that to make a new price for material unnecessarily, and then to make a new demand for labor to meet such unnecessary prices, has about reached its limit, and will lead to trouble some of these days. The most suggestive feature of the whole business is that the firm claiming to have the best equipped plants and the best facilities should be the leader in a disruption of values which affects most seriously scores of manufacturers and reduces scores of thousands of employees almost to the verge of pauperism. In its present condition labor can make only a very feeble resistance, but the time will come when it will again assert itself, and then we shall see something.

Pig Iron.—The market has been duller and more uninteresting than usual, and while there has been no great pressure to effect sales consumers recognize the fact that they can easily place orders at figures recently ruling, and on some new Irons at slightly lower figures. In other words there is more Iron offering, and although prices are nominally unchanged, it only needs the right kind of a bid to secure more or less of a reduction. Large consumers are not in the market to any extent, and for the time being buyer and seller alike are touching the market carefully, the former expecting a turn in his favor either in chance lots or in the general drift of things the latter hoping for a bid which can be accepted without making a direct offer, or without a di-

rect and perhaps useless lowering of his price. It is a very hard market, and on the whole less favorable to the seller than we have yet seen, although, of course, there is still a chance that the current demand may enable holders to maintain their position. General asking quotations for seaboard deliveries are about as follows:

| | |
|---------------------------|-------------------|
| No. 1 Foundry | \$13.75 @ \$14.25 |
| No. 2 Foundry | 13.00 @ 13.25 |
| Standard Gray Forge | 11.50 @ 12.00 |
| Ordinary Gray Forge | 11.00 @ 11.25 |

Steel Billets.—There is some little demand, several lots of 500 to 1000 tons each having been taken at \$18.15 to about \$18.35, delivered. There is a full supply of ordinary Soft Steel at the outside figure, and taking it all around the market is a little heavy, and low as prices are, there is nothing to indicate any immediate improvement.

Finished Material.—The report of last week might be repeated again, and would still define the situation correctly. Some of the local mills are doing very well on small orders, and a few are enabled to run double turn on just that class of work. Consumers who feel it their interest to turn out good work cannot afford to jeopardize it by an apparent saving of a few cents per hundred pounds on the material; and, fortunately, this class are becoming more numerous every day. Some have had personal experiences to convince them that it does not pay to make such experiments, while others have in mind the time when it was more of a favor to get material than it is to-day, so that those degenerate times have generated a feeling of loyalty which seems to promise good results in the future. These remarks apply particularly to Plates, Bars and Sheets, although in big lots where "money talks" some people appear willing to go over to the enemy, providing the inducement is made big enough. Large orders are few and far between, however, the only one to-day being 1000 to 1200 tons Plates and Shapes for the New Jersey Iron & Steel Company, on which it is impossible to give any correct quotation, because, as was remarked last week, price is of no account so long as the order is sufficiently large. Small lots of good quality are quoted about as follows:

| | |
|-------------------------------|---------------|
| Grooved Skelp, delivered..... | 1.40¢ @ 1.45¢ |
| Best Refined Bars..... | 1.40¢ @ 1.45¢ |
| At interior points..... | 1.30¢ @ 1.35¢ |
| Tank Steel..... | 1.45¢ @ 1.55¢ |
| Heavy Plates..... | 1.50¢ @ 1.60¢ |
| Shell..... | 1.60¢ @ 1.75¢ |
| Flange..... | 1.90¢ @ 2.00¢ |
| Angles..... | 1.60¢ @ 1.70¢ |
| Beams and Channels..... | 1.65¢ @ 1.80¢ |

Old Material.—The demand is of the same languid, uncertain character as recently reported. Prices depend altogether on the pressure to realize, but ordinarily asking prices are about as follows:

| | |
|---------------------------|-------------------|
| Heavy Melting Steel..... | \$10.50 @ \$11.50 |
| Light Melting Steel..... | 8.00 @ 9.00 |
| No. 1 Wrought Scrap | 11.50 @ 12.00 |
| Machinery Cast..... | 9.50 @ 10.50 |
| Wrought Turnings..... | 9.50 @ 10.00 |
| Cast Borings..... | 6.50 @ 7.00 |
| Old Iron Rails | 13.00 @ 13.50 |

The Pennsylvania Bolt & Nut Company of Lebanon, Pa., recently received an order for their Bar Iron for shipment to China. They also received an order from Italy, but declined it on account of the unsettled condition of affairs in that country.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, January 17, 1894.

Pig Iron.—Freight rates on Southern Pig Iron were not advanced on the 15th as had been expected and railroad authorities state that no advance will be made before June 30, while the presumption is strong that they will never be restored to the former figure. Very little business has transpired in Southern Iron and prices appear to be somewhat weaker. Our quotations have been shaded on some sales of small lots. Business in local Coke has not improved in accordance with the increased inquiry reported last week. Outside of a 1000-ton sale transactions have been confined to small lots. Travelers through the Northwest report prospects unfavorable to much business in the near future from that section. This does not arise from lack of confidence among foundrymen, or the hope that prices will be lower, but really on account of the limited amount of work which is now obtainable. There is some expectation, however, that business will improve in this immediate vicinity as spring approaches. The Iroquois Furnace is preparing to blow in about February 1, which would hardly be done if the management believed there would be much difficulty in disposing of product. Lake Superior Charcoal is still neglected. Quotations are now as follows for cash:

| | |
|----------------------------------|-------------------|
| Lake Superior Charcoal..... | \$15.30 @ \$15.50 |
| Local Coke Foundry, No. 1..... | 13.00 @ 13.50 |
| Local Coke Foundry, No. 2..... | 12.50 @ 12.75 |
| Local Coke Foundry, No. 3..... | 12.00 @ 12.50 |
| Local Scotch..... | 13.50 @ 14.00 |
| Ohio Strong Softeners No. 1..... | 15.50 @ 16.00 |
| Southern Silvery, No. 1..... | 13.75 @ 13.75 |
| Southern Silvery, No. 2..... | 13.25 @ 13.25 |
| Southern Coke, No. 2..... | 11.90 @ 12.15 |
| Southern Coke, No. 3..... | 11.40 @ 11.65 |
| Southern, No. 1, Soft..... | 11.90 @ 12.15 |
| Southern, No. 2, Soft..... | 11.40 @ 11.65 |
| Tennessee Charcoal, No. 1..... | 16.00 @ 16.50 |
| Tennessee Charcoal, No. 2..... | 15.00 @ 15.00 |
| Southern Gray Forge..... | 10.60 @ 10.85 |
| Alabama Car Wheel..... | 18.00 @ 18.50 |
| Jackson County Silvery..... | 16.00 @ 16.50 |
| Other Ohio Silvery..... | 15.00 @ 15.50 |

Bars.—Transactions have been confined to small lots only and these came from scattered buyers who are merely meeting their actual necessities. Time contracts are wholly lacking. The Agricultural works appeared to be supplied for the present and the car shops seem to be in no need of material, although they are gradually securing more work. This branch of trade has recently been disturbed by the appearance of a large Pittsburgh concern very anxious to secure business in Soft Steel Bars, which is a trade in which they have not figured to much extent. Prices are somewhat weaker and may now be quoted at 1.25¢ @ 1.35¢, Chicago, for mill shipments of Common Bars of Soft Steel with half Iron extras. Jobbers report a diminished demand from store, showing that small consumers are not securing much business. Prices from stock are ranging from 1.50¢ to 1.60¢ according to quantity and quality.

Structural Material.—A large warehouse is coming into the market which will require nearly 1000 tons of Beams and Cast and Wrought Iron, and the contract will probably be let this week. Business in a general way has picked up to some extent and much more is doing in small lots of Beams and Bridge Materials. Quotations are as follows, Chicago delivery: Beams, 1.55¢ @ 1.60¢; Tees, 1.85¢ @ 2¢; Angles and Universal Plates, 1.55¢ @ 1.60¢. Small lots are sold from stock at an advance of about 15¢ @ 100 above these prices.

Plates.—The Chicago Ship Building Company are now receiving bids for material for a large vessel which will require 900 tons of Plates and about the same quantity of Beams and Angles. An inquiry is also in the market for 600 tons of Plates for riveted pipe for the Pacific Coast. Mill shipments to the ordinary trade have again improved to some extent, but without imparting any better tone to the market. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.50¢ @ 1.60¢; Flange Steel, 1.90¢ @ 2¢; Fire Box, 2.75¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 2¢ @ 2.10¢; Tank Steel, 1.90¢ @ 2¢; Flange Steel, 2.40¢ @ 2.65¢; Boiler Tubes, 70 and 5 % off. Omission is made from these quotations of Sheet Steel, which is a distinction now growing obsolete and, therefore, not worthy of further recognition.

Sheets.—Good inquiries are reported for Black Sheets, and competition on this business is likely to give rise to a new adjustment of prices. Nominal quotations are continued on mill shipments of No. 27 Common at 2.65¢ @ 2.70¢, Chicago. Small lots from stock are selling at 2.80¢ @ 2.90. Galvanized Iron is moving a little more freely, but prices show no improvement. Mill shipments of Juniata Galvanized continue to be quoted at 75 and 10 % off. Small lots from stock are selling at varying prices, according to the size of the order, from 70 % to 70 and 10 %. Sheet is quoted at 30 % @ 35 % off, according to quantity.

Merchant Steel.—The business of the past week embraced some fair orders of Machinery Steel, but in other respects the market seems quiet. Prices are unchanged. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery, Tire and Open Hearth Spring Steel, 1.90¢ @ 2¢; Ordinary Bessemer Machinery, 1.60¢ @ 1.65¢; Ordinary Bessemer Tire, 1.55¢ @ 1.60¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

Billets and Rods.—The Joliet Works will start again on the 22d making Billets only, but no new business has transpired, in the absence of which quotations are nominally \$18 @ \$18.25, Joliet. Wire Rods have sold in moderate quantities at \$26 in this vicinity.

Rails and Track Supplies.—The Illinois Steel Company hope to be able to start their South Mill on Steel Rails early in February. The prospects are that by that time enough business will have been secured to warrant them in starting up. Contracts are being received but not in as great quantity as would be expected at this time of the year. Prices are firm at \$25 @ \$27, according to quantity. Splice Bars are lower and may now be quoted at 1.30¢ @ 1.35¢; Track Bolts with Hexagon Nuts are selling at 2.50¢ @ 2.55¢; Spikes, 1.90¢ @ 1.95¢.

Old Rails and Car Wheels.—A wide difference of opinion prevails as to the value of Old Iron Rails. Reports are current that one railroad has offered a lot at \$11, spot cash, while sales have been made at \$12 @ \$12.50, and yet some prominent roads insist that the actual value of Rails is about \$13.50. Old Steel Rails are very quiet, with dealers naming \$7 @ \$10 as about the price, according to length. Old Car Wheels have a speculative value of \$10 @ \$11, but consumers are still neglecting them.

Scrap.—The business of the past week was very much less than that of the previous week, as consumers have their wants supplied for some time, and are not disposed to accept offers made by either dealers or railroads. The dealers have reduced prices and are now offering No. 1 Forge at \$9.50. Other classes of material are offered at proportionate prices, with Heavy Scrap \$7.50.

Metals.—Carload lots of Lake Copper are unchanged at 10½¢, while casting brands are quoted at 9¾¢, with some sales reported. A considerable quantity of Scrap Copper has been sold within the past month for shipment to Germany. Spelter is exceeding quiet and now quotable at 3.30¢ @ 3.32½¢ in carload lots. Sales of moderate quantities of Pig Lead have been made at about 3 05¢.

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building,
PITTSBURGH, January 18, 1894.

A comparison of the condition of the Iron and Steel trades at this time with the same period last month shows a slight gain in inquiries and a lower range in prices. Last month was undoubtedly the quietest month ever known in the Iron trade, and where material was needed, and perhaps badly needed, its purchase was delayed until this month, if it was possible to get along without it. This has resulted in a good many orders being placed this month that properly should have been placed in December. One encouraging feature thus brought out is that stocks of both Raw and Finished Material have been reduced to a minimum. This being the case, it is not unreasonable to suppose that just as soon as buyers believe that prices have touched bed rock, or nearly so, there will be a material increase in volume of business. It does not often occur that prices of Iron and Steel products remain stationary for any great length of time, and it is certain that we are nearer bottom of the market to-day than ever before. With tariff legislation out of the way, the road seems clear for a steady march forward in demand at least, with perhaps better prices before a great while. The low prices ruling for Wire and Wire Nails have stimulated demand for these products considerably, and there is nothing to prevent the whole line from being similarly affected.

Pig Iron.—No actual increase in demand has taken place, but there are symptoms present which lead to the belief that the situation will not get any worse, but may soon show improvement. With Bessemer Iron ruling at about \$10.75 and less in Pittsburgh there is not much inducement for makers to force the market, nor, on the other hand, have buyers shown any inclination as yet to buy very far ahead. However, we are advised that in a few cases where buyers have contracts running for two or three months ahead they have notified the seller that they will be able to take the Iron out a little ahead of time. This is indicative of an increased consumption in certain sections, which may become general before long. With Coke obtainable for the first six months of this year at \$1 ½ ton, and perhaps less, Pig Iron makers are now better able to meet present low prices than ever before. In addition to this a reduction of 10 % in labor at the three or four active stacks in the Ma-

honing Valley goes into effect to-day. While it is possible for a well equipped furnace to turn out Bessemer Iron at \$10, using present costs of labor, Coke and Ore as a basis, it should not be forgotten that furnacemen are still paying last year's prices for Ore, and in such event it is extremely doubtful if \$10 at furnace covers cost of production. We quote as follows:

| | | |
|-------------------------|----------|---------------|
| Neutral Gray Forge..... | \$9.85 @ | \$10.00 cash. |
| All-Ore Mill | 10.00 @ | 12.25 " |
| No. 1 Foundry..... | 11.75 @ | 12.00 " |
| No. 2 Foundry..... | 11.25 @ | 11.50 " |
| Bessemer | 10.85 @ | 10.75 " |

We note a sale of 1000 tons of Bessemer for January and February at \$10.75, Pittsburgh; also a sale of 500 tons of city made Gray Forge at \$10, delivered. It is reported that Bessemer Iron has been offered at a price equal to \$10.50, Pittsburgh.

Ferromanganese.—We note a sale of 100 tons of 80 % domestic for January and February delivery at \$52, delivered at buyers' mill, which can be considered the ruling price in this market.

Billets.—The Steel market continues quiet, although inquiries are better so far this year than in December. The conviction is growing that Steel at \$16, and perhaps less, is very close to bottom, and that any further material declines in prices are next to impossible. Within the past week there was considerable effort on the part of makers to secure business, and as a result, very attractive prices were offered. The market may be fairly quoted at \$16 @ \$16.25 at mill, the first named price being for desirable orders with favorable terms of settlement attached. Of course, there remains the possibility that a buyer coming into the market for a large block of Steel would be able to shade our lower quotation, but to accomplish this the order would have to be an attractive one and the terms cash against bill of lading, or nearly so.

Structural Material.—All things considered the demand is fairly satisfactory, indications pointing to a heavy tonnage this year on account of the low price ruling for Beams and Channels. Pittsburgh is said to be doing about three-fourths of the entire business of the country in Structural Material. Prices depend altogether on the nature of the order, 1.40¢, Pittsburgh, on Beams having been shaded for attractive business. For ordinary lots the following prices represent the market: Beams and Channels up to 15 inches, 1.40¢; Angles and Universal Plates, 1.40¢ @ 1.50¢; Tees, 1.60¢ @ 1.75¢.

Plates.—Several good sized contracts have recently been placed, one of these being the order of the Newport News Shipbuilding Company, and of course was taken by Pittsburgh. It is claimed that the price at which this contract was placed makes a profit impossible, and a direct loss probable. There is more business going, and the outlook is fairly encouraging. Prices depend altogether on the order. If the first price made to the buyer does not bring the business, another is made that will. Prices on ordinary lots are ruling about as follows: Tank Steel, 1.30¢ @ 1.35¢; Shell, 1.50¢ @ 1.60¢; Flange, 1.65¢ @ 1.70¢; Ordinary Fire Box, 1.75¢ @ 1.85¢; Railroad Fire Box, 2¢ @ 2.15¢.

Bars.—Reports from the leading makers indicate that the demand shows no improvement, and that the outlook is discouraging. The request of the Valley mills for a \$3.50 puddling rate after April 1 has caused an unsettled feeling to some extent. In the Pitts-

burgh district boiling is being done as low as \$3.80, so that the demand of the Valley mills cannot be said to be an unreasonable one. Prices continue to depend altogether on the nature of the order. Steel Bars are held at 1.25¢ at mill, with Bar Iron extras. In the Valley mills Iron Bars are held at 1.20¢ @ 1.25¢, half extras. For desirable orders the above quotations would probably be shaded.

Muck Bars.—We quote nominally at \$20 @ \$20.50, delivered, for best grades. There is nothing doing.

Wire Rods.—The demand shows signs of improvement, probably due to the increased demand for Wire Nails. Rods may be quoted at \$23.50 at maker's mill.

Steel Rails.—Nothing important has developed for several weeks. Under the new Rail agreement, which became effective on January 1, the quotation of \$24 at mill prevails.

Merchant Steel.—There is nothing new to report, the volume of business being small, although there are indications that some delayed contracts will soon be placed. Prices are unchanged, and are ruling about as follows: Bessemer Machinery, 1.50¢; Open Hearth Machinery, 1.75¢; Machine Straightened Tire, 1.65¢; Sleigh Shoe, 1.80¢ @ 1.90¢; Toe Calk, 1.95¢ @ 2.05¢; Open Hearth Spring, 1.85¢ @ 1.90¢; Tool Steel, 5½¢ and upward.

Skelp Iron and Steel.—The demand is only fair, with prices ruling about as follows: Grooved Steel Skelp, 1.05¢ @ 1.10¢; Sheared, 1.15¢ @ 1.20¢; Grooved Iron Skelp, 1.25¢ @ 1.30¢; Sheared, 1.40¢ @ 1.45¢. The lower quotation on Grooved Steel Skelp is occasionally shaded to some extent.

Pipes and Tubes.—Trade does not show any improvement, either in demand or prices. A recent order for 3½ miles of 8-inch Line Pipe was taken at the lowest price ever made. Prices depend entirely upon the nature of the order and terms of payment.

Barb Wire.—The extremely low prices ruling have stimulated demand to considerable extent, and with the time at hand for the placing of spring contracts, the outlook for a heavier volume of business is improved. Prices continue as follows: Four Point Galvanized, \$2.10 at mill in carload lots, with 40¢ less for Painted.

Wire Nails.—The low prices ruling for Wire Nails for some time have had the effect of stirring up buyers, and considerable business has been placed since the first of the year. We quote Wire Nails at \$1.10 in carload lots at mill. For attractive business, it is probable this price would be shaded to slight extent. The Cut Nail market is improving, and large shipments continue to be made by Wheeling mills to Southern points, by way of Ohio River. Mills continue to quote 95¢ at mill for fair sized averages.

Connellsville Coke.—Important developments in the Coke trade are expected within the next week or two. On the last day of this month the wage scale of the H. C. Frick Coke Company, made three years ago, expires, and a new scale has been prepared. For some time wages at some works in the Connellsville region have averaged 25 % less than the Frick scale. Should this new scale call for a greater reduction than would put their employees on an equal basis with wages paid by other operators, it is not improbable that a strike will take place. If trouble occurs,

the Carnegie interest is in good position to meet it, as a tremendous stock of Coke is on hand at the Edgar Thomson Steel Plant. The trade will no doubt await with considerable interest the final outcome of the negotiations between the Frick concern and their employees. Prices on Coke continue somewhat demoralized, and depend largely upon the nature of the order. Connellsville Furnace Coke for the first six months of the year is freely offered at \$1.00 and \$1.05, per ton of 2000 pounds at oven. It has also been offered as low as 90 cents per ton, but it is extremely doubtful if a six months' contract would be accepted at this price. Selected 72-hour Foundry Coke is held at \$1.00 to dealers and \$1.15 to consumers, but these prices are occasionally shaded. Crushed Coke, all sizes, is held at \$1.40 to consumers. On January 6, 1894, there were 8396 ovens in the Connellsville region in blast and 9117 ovens idle.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building,
St. Louis, January 17, 1894.

Pig Iron.—During the past week some good sales were made, but at prices that are lower than any heretofore named. When the downward tendency will finally halt is not now taken into consideration. Furnaces are protecting their trade by meeting competition, and this competition is daily growing more spirited. Consumers are buying sparingly, and the fact that each purchase is made at a price lower than the last only induces them to continue this policy. Stocks of iron on the furnace banks are heavy and fully ample to meet all the requirements of the trade. No. 1 Foundry is now quoted at \$12 @ \$12.25, f.o.b. cars St. Louis, and No. 2 Foundry at \$11, same terms. We quote as follows for cash, f.o.b. cars St. Louis:

| | |
|------------------------------------|-------------------|
| Southern Coke, No. 1 Foundry | \$12.00 @ \$12.25 |
| Southern Coke, No. 2 Foundry | 11.25 @ 11.50 |
| Southern Coke, No. 3 Foundry | 10.50 @ 10.75 |
| Southern Gray Forge | 10.00 @ 11.25 |
| Southern Car Wheel | 17.00 @ 18.00 |
| Lake Superior Car Wheel .. | 16.50 @ 17.00 |
| Ohio Softeners | 13.75 @ 16.25 |

Bar Iron.—The market is no better than last reported. Mills are ready to take orders, and the matter of price hardly enters into consideration. From 1.25¢ to 1.30¢ is the general mill quotation, but these prices are shaded on good specifications. Store price is 1.60¢ @ 1.65¢.

Barb Wire.—The movement in Barb Wire is somewhat larger than last week. With a number of mills closed down and a number of others working on half time there is no great amount of stock on hand, and therefore no great urgency to sell. Prices are unchanged at \$1.85 for Painted. At this price manufacturers seem to have drawn the line and are disposed to refuse orders rather than shade it. A stiffening in price seems probable, as the spring trade is expected to be heavy.

Wire Nails.—Continued demoralization is to be reported in this department. Local mills quote \$1.20 @ \$1.25 in carload lots to jobbers, but outside manufacturers are shading this price, and are of course securing the business. An upward turn in prices would largely increase trade, as many dealers

are waiting for Nails to reach bottom before placing their orders.

Cut Nails.—There is some improvement in the demand for Cut Nails, but prices continue weak and unsatisfactory. The Valley Steel Company, successors to the Belleville Steel Company, have started up their Cut Nail mill and are turning out 5000 kegs weekly.

Rails and Track Supplies.—There is nothing new to report either as regards prices or demand, both of which are nominal. We quote as follows: Splice Bars, 1.55¢ @ 1.60¢; Spikes, 1.85¢ @ 1.90¢; Bolts, Square Nuts, 2.35¢; with Hexagon Nuts, 2.45¢; Links and Pins, 1.80¢ @ 1.85¢. Old Iron Rails, \$13 @ \$13.50. Steel Rails quoted at \$26 @ \$27, according to quantity.

Pig Lead.—The conditions governing this metal are unchanged. Sellers quote 3¢, at which price an occasional carload order is taken. The market is fairly steady, and is in a position to readily respond should trade improve.

Spelter.—At 3.27½¢ the carload trade is being accommodated and as this is about the only trade now in sight, sellers are glad of the opportunity of securing these orders. The market is weak, and at the moment shows no sign of improving.

The Valley Steel Company, Belleville, Ill., have established offices in the American Central Building, St. Louis, Mo. This is the company who have purchased the entire plant formerly owned by the Belleville Steel Company. The Cut Nail department has been started up, and will turn out 5000 kegs weekly. The rail and channel mills will also be started up in a few days, as soon as a few necessary repairs are made. They will also make Soft Steel Billets and Merchant Bars.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,
CINCINNATI, January 17, 1894.

While there has been some little increase in the demand for Pig Iron during the past week it was not large enough to be significant, the total transactions falling short of 10,000 tons including the current consumptive demand from the jobbing foundries, which are apparently doing a little more business. There was some buying by the Iron Pipe Works in the South, but not to any large extent, the largest sale being 2000 tons for delivery running through four months. The tone of the market is decidedly weak, and if there was any disposition to buy largely it is apparent that concession of at least 25¢ per ton could be secured on most if not all grades of Foundry Iron, and perhaps Gray Forge might be included, but in the absence of transactions we let the quotations stand. There have been some small sales of Charcoal Iron, but nothing has transpired to indicate any essential change in the market. There is not much increase in the deliveries of Pig Iron on contracts, but buyers are not fighting them off so strenuously, and are hoping, seemingly with some ground, for better things in the not far distant future. Quotations are as follows:

Foundry.

| | |
|-----------------------------------|-------------------|
| Southern Coke, No. 1 | \$11.75 @ \$12.00 |
| Southern Coke, No. 2 | 10.75 @ 11.00 |
| Southern Coke, No. 3 | 10.25 @ 10.50 |
| Ohio Soft Stone Coal, No. 1 | 15.50 @ 16.00 |
| Ohio Soft Stone Coal, No. 2 | 14.50 @ 14.75 |
| Lake Superior Coke, No. 1 | 15.00 @ 15.25 |
| Lake Superior Coke, No. 2 | 14.00 @ 14.25 |

| | |
|---------------------------------|---------------|
| Hanging Rock Charcoal, No. 1 .. | 18.50 @ 19.00 |
| Hanging Rock Charcoal, No. 2 .. | 17.50 @ 18.00 |
| Tennessee Charcoal, No. 1 | 14.00 @ 14.25 |
| Tennessee Charcoal, No. 2 | 13.00 @ 13.25 |

Car Wheel and Malleable Irons.

| | |
|---|---------------|
| Standard Southern Car Wheel .. | 17.75 @ 18.00 |
| Lake Superior Car Wheel and Malleable | 17.00 @ 17.25 |

Forge.

| | |
|--------------------|--------------|
| Gray Forge | 9.75 @ 10.00 |
| Mottled Coke | 9.50 @ 9.75 |

Metal Market.

Pig Tin.—Slow trade and lower prices stand as the prominent features of the market for the week under review. There has been hardly any speculative movement here and very little tendency in that direction. Trade and consumptive demand have continued to be comparatively light, and for the most part at a slightly lower level of prices. The dullness of trade here, along with the further depreciation in London values, has caused prices to droop still further, leaving a net loss for the week of about 0.10¢. Ten-ton lots have been sold at 20.10¢ @ 20.15¢, to a moderate extent, and jobbing parcels at corresponding prices. At this writing bids above 20¢ net cash for round lots are few and far between. Straits shipments during the first half of January were 675 tons Great Britain and America and 250 tons to the Continent, against a total of 1750 tons in the corresponding period last year.

Copper.—Warnings of something in the nature of a real break in prices were sounded on the Metal Exchange on Tuesday, when Lake Superior Ingot was offered at 10¢ for delivery from February to May, inclusive, and at 9½¢ for June and July delivery. Representatives of the leading producers intimated that those prices were purely speculative and no reflex of true market value, but, whatever the facts in this connection, it was demonstrated beyond all question of doubt that sales of Lake Ingot have been made at 10¢ regular terms. It is also worthy of note that small lots were subsequently offered at the same price. Some effort is made to keep quotations for Electrolytic Copper on a level with those current for Lake Ingot, but on actual sale anything above 9½¢ is the exception where other than small parcels are involved. Casting Copper is quoted at about 9½¢ @ 9¾¢, according to brand and quantity, with only moderate quantities selling.

Pig Lead.—Prices have remained almost stationary and business has been exceedingly slow. It is asserted that 2500 tons or more are in store here or held by local merchants; that the principal consumers are carrying more surplus stock than usual, and that a considerable accumulation has taken place at Western points during the past month or six weeks. In short, the statistical position would appear to be unfavorable and the market suffered from the fact that considerable quantities of Lead remain in the hands of operators, who bought more or less freely at from 3¼¢ down to 3½¢ on the theory that Lead was very cheap at those prices. Unfortunately, theory and fact failed to harmonize, and at 3.20¢, the current quotation, probably the entire holdings could be duplicated.

Spelter.—The position of the market is practically the same as it was at the date of last market report. On the theory that prices are phenomenally low, most holders seem inclined to stand out for better prices, but the weight of facts causes others to make the most of

a poor position, and the result is that not only common Western, but brands that run somewhat above the average in quality, have been sold at 3.55¢ in single carload lots for prompt and near future shipment. Business in inferior brands has been effected at as low as 3.50¢, prompt shipment from the West.

Antimony.—Dealings have been of a perfunctory character and moderate all told. Prices remain quite steady at 9½¢ @ 9½¢ for Hallett's and 10½¢ @ 10½¢ for Cookson's, in wholesale lots.

Tin Plate.—Quite a good business has been effected in Coke Plates for near future shipment, and fair contracts were placed for special sizes. The prices were invariably low, however, or, on the average, about 5¢ @ 7½¢ below those current for spot goods. Otherwise nothing but strictly commonplace dealings have been effected and the demand for spot stock keeps considerably behind the average for this season of the year. Prices on spot goods are somewhat irregular, with the general tendency in buyers' favor and the following range quoted: Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. B. grade, do., \$5.30; Bessemer full weight, \$5.25; light weights, \$4.85 @ \$4.90 for 100 lb, \$4.80 for 95 lb, \$4.60 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.45; Siemens Steel, IC basis, \$5.55 @ \$5.60; IX basis, \$6.60. Charcoals—Melyn grade, IC, \$6.35; Crosses, \$7.87½; Allaway grade, IC, \$5.55; Crosses, \$6.75; Grange grade, IC, \$5.65; Crosses, \$6.85. Charcoal Terns—Worcester, 14 x 20, scarce; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.35 @ \$7.37½; do., 20 x 28, \$14.75; Dean grade, 14 x 20, \$5.35; do., 20 x 28, \$10.50 @ \$10.60; D. R. D. grade, 14 x 20, \$5.15; do., 20 x 28, \$10.10; Alyn, 14 x 20, \$5.35; do., 20 x 28, \$10.50; Wasters—S. T. P. grade, 14 x 20, \$4.75; do., 20 x 28, \$9; Abercarne grade, 14 x 20, \$4.60; do., 20 x 28, \$8.87½.

The monthly production of Copper in the United States since July, 1892, has been as follows, the first column giving the aggregate returns from the reporting mines, which include the principal Lake, Montana and Arizona producers; the second being the metal from pyrites and from a number of smaller outside sources, being estimated:

American Product.

| 1892. | Reporting mines. Gross tons. | Outside sources. Gross tons. | Total. Gross tons. |
|-----------------------|---------------------------------|---------------------------------|-----------------------|
| July..... | 9,294 | 924 | 10,218 |
| August..... | 10,807 | 870 | 11,677 |
| September..... | 9,710 | 994 | 10,704 |
| October..... | 9,668 | 1,269 | 10,937 |
| November..... | 9,888 | 1,036 | 10,924 |
| December..... | 9,872 | 1,174 | 11,046 |
| Total six months..... | 59,239 | 6,287 | 65,526 |
| 1893. | | | |
| January..... | 9,187 | 989 | 10,176 |
| February..... | 8,213 | 1,042 | 9,255 |
| March..... | 9,065 | 1,321 | 10,386 |
| April..... | 11,775 | 1,042 | 12,817 |
| May..... | 12,706 | 1,042 | 13,748 |
| June..... | 11,524 | 1,042 | 12,566 |
| Total six months..... | 62,470 | 6,478 | 68,938 |
| 1893. | | | |
| July..... | 11,049 | 1,042 | 12,091 |
| August..... | 11,745 | 1,042 | 12,787 |
| September..... | 11,750 | 1,042 | 12,792 |
| October..... | 11,503 | 1,042 | 12,545 |
| November..... | 10,705 | 1,042 | 11,747 |
| December..... | 10,538 | 1,042 | 11,580 |
| Total six months..... | 67,290 | 6,252 | 73,542 |
| Total year 1893..... | 129,760 | 12,780 | 142,490 |

The product of the foreign reporting mines and the United States exports were as follows:

| 1892. | Foreign reporting mines. Gross tons. | 1892. | United States exports. Gross tons. |
|----------------------------|---|----------------------------|---------------------------------------|
| July..... | 6,358 | July..... | 3,450 |
| August..... | 6,853 | August..... | 1,545 |
| September..... | 5,478 | September..... | 1,458 |
| October..... | 6,476 | October..... | 3,144 |
| November..... | 6,789 | November..... | 3,897 |
| December..... | 7,666 | December..... | 4,486 |
| Total six months..... | 39,655 | Total six months..... | 17,980 |
| 1893. | | 1893. | |
| January..... | 5,736 | January..... | 3,171 |
| February..... | 6,762 | February..... | 1,815 |
| March..... | 6,896 | March..... | 2,334 |
| April..... | 6,913 | April..... | 3,450 |
| May..... | 6,806 | May..... | 4,482 |
| June..... | 7,935 | June..... | 5,109 |
| Total six months..... | 41,048 | Total six months..... | 20,361 |
| 1893. | | 1893. | |
| July..... | 6,095 | July..... | 7,181 |
| August..... | 7,057 | August..... | 9,127 |
| September..... | 6,303 | September..... | 16,131 |
| October..... | 7,081 | October..... | 11,478 |
| November..... | 6,953 | November..... | 7,821 |
| December..... | 7,248 | December..... | 8,293 |
| Total last six months..... | 40,647 | Total last six months..... | 60,031 |
| Total 1893..... | 81,495 | Total, 1893..... | 80,392 |

The United States Iron & Tin Plate Mfg. Company of Demmler, Pa., have issued in very convenient form for reference a table for the quick determination of prices of various sizes of Tin Plate where the price per box of 14 x 20 is given as a basis.

Financial.

For the first time in many weeks, the trade reports published last Saturday told of an improvement in general business which, though still somewhat limited as compared with former years, is yet sufficiently marked. *Dun* and *Bradstreet* both report improved trade conditions, and offer hopes of the setting in of a change for the better. Yet the financial situation shows but little material improvement. Payments through clearing houses throughout the country in the first two weeks of January were about 27 per cent. less than last year, while the decrease in railroad earnings reported for the same period was 14 per cent. The latest Treasury statement exhibits a gold balance of less than \$71,500,000, and the shrinkage has been going on steadily, while nothing has been done by the Treasury officials to check the depletion of the reserve. New York bankers, while perfectly willing and ready to assist the Government to any reasonable extent, have, nevertheless, become restless at the tardiness of the Government's financial officers in making provision for the emergency. Secretary Carlisle's published letter to the chairman of the Senate Finance Committee in regard to an issue of short time bonds at low interest appears, therefore, to meet with general approval among bankers, as a sign that something will be done in the matter. Particular satisfaction has been drawn from the tone of decision which stamps the letter above referred to with evidence that the Secretary is fully alive to the importance of the occasion. Mr. Carlisle intimates therein that he is resolved, should Congress not clothe him immediately with special authority to issue bonds, to borrow for the needs of the Treasury on the best terms possible under existing laws. This declaration is taken as a reassuring sign that the Government's financial resources will not be allowed to go much lower, whether Congress

takes immediate action in the matter or not.

Meanwhile the flow of money from interior points into the New York banks continues in an increasing stream. According to the weekly statement, published on Saturday, an average gain in cash of \$11,134,300 was made by the Associated Banks of New York, while deposits increased \$9,389,100, and loans decreased \$622,200, showing that speculation and enterprise are still stagnant. The loans are now \$110,000,000 below the deposits. The result of all last week's changes was a further gain of \$8,787,000 in the surplus reserve, which is now swollen to the enormous sum of \$92,500,000 over legal requirements. The holding of such a vast amount of unproductive money is becoming a serious matter with many banks, which have to pay interest on a considerable proportion of it. An issue of Government bonds would be gladly welcomed as a profitable outlet for some of this idle capital.

Money continues extremely easy at this center. Loans on call, representing bankers' balances, are abundant at 1%, while some loans under this head have been made as low as ¾ of 1%. The supply of time loans far exceeds the demand, which is very indifferent. The ruling nominal quotations are 2% for 30 days, 2½% for 60 days, 3% for 90 days and four months and 3½% @ 4½% for six months and longer. Lower rates than these can, however, be easily obtained by borrowers for good collateral. Mercantile paper is very quiet in consequence of the absence of any quantity of a good grade. The demand for good material is at the same time active, and rates are higher, being quoted at 3½% @ 4% for indorsed bills, 4½% @ 5% for first class single names and 5% @ 5½% for others.

| | High- est. | Low- est. | Closing Jan. 17. |
|-----------------------------|---------------|--------------|---------------------|
| Am. Sugar Ref..... | 84½ | 80½ | 83½ |
| Atchison, T. & S. Fe..... | 11½ | 10½ | 11½ |
| Chicago Gas..... | 67½ | 63½ | 66½ |
| Chic., B. & Q..... | 76½ | 73½ | 75½ |
| Chic., Mil. & St. Paul..... | 58½ | 55½ | 57½ |
| Chic. Rock Isl. & Pac..... | 66½ | 64 | 66½ |
| Del. & Hudson..... | 135 | 133 | 134½ |
| Del., Lack. & Western..... | 170½ | 164 | 168½ |
| Gen. Electric..... | 38½ | 34½ | 36½ |
| Lake Shore..... | 123½ | 121½ | 122½ |
| Louisville & Nashville..... | 44½ | 40½ | 43½ |
| Manhattan..... | 123½ | 118½ | 120½ |
| Missouri Pacific..... | 22½ | 20½ | 21½ |
| National Lead, Common..... | 27 | 24½ | 27 |
| New Jersey Central..... | 116½ | 114½ | 115 |
| New York Central..... | 99½ | 97½ | 98½ |
| N. Y., L. E. & Western..... | 15½ | 14 | 14½ |
| N. Y. & New England..... | 13½ | 11½ | 13 |
| Northern Pacific, Pfd..... | 16½ | 13½ | 15½ |
| Philadelphia & Reading..... | 20½ | 18 | 19½ |
| Richmond & West Pt. | | | |
| Term..... | 2½ | 2 | 2½ |
| St. Paul & Omaha..... | 36 | 34½ | 35 |
| Union Pacific..... | 19½ | 17½ | 19 |
| Western Union..... | 86½ | 83½ | 85½ |

Government bonds have been fairly active and firm, but close at a slight decline from last week's prices. Closing quotations were as follows:

| | Bid | Asked. |
|----------------------------|------|--------|
| 2's, 1891, registered..... | 95 | — |
| 4's, registered..... | 112¾ | 113¾ |
| 4's, coupon..... | 112¾ | 113¾ |

The railway and miscellaneous bond market has been more active, with a somewhat higher range of prices. A brisk demand for good lines of bonds reflected the investment of a portion of the January dividend payments. The business effected lately in State and city bonds is said to show a marked increase, although these securities have not been placed at a sacrifice, but disposed of at satisfactory rates.

Sterling exchange has been dull and firm, with a moderate supply of com-

mercials bills, and no excessive demand from remitters. Rates were advanced a fraction early in this week, and gold exports began to be again spoken of. Bankers say, however, that this condition is not likely to be reached at present. Actual business in sterling was done on Wednesday at the following rates, namely: At \$4.83½ @ \$4.85 for 60 days, \$4.86½ for demand, \$4.87 @ \$4.87½ for cables, and \$4.83½ for commercial.

Domestic exchange on New York is quoted as follows: New Orleans, commercial 25 premium, bank 100 premium; Charleston, buying par, selling ½ @ ½ premium; San Francisco, sight ½ @ ½ premium; Savannah, buying ½ discount, selling par @ ½ premium; Chicago, 70 premium; St. Louis, 90 premium.

Bar silver is quoted in London at 31½ pence and in New York at 69 cents per ounce. Nearly 1,100,000 ounces have been shipped to Europe during the week.

New York.

Office of *The Iron Age*, 95-102 Reade street, }
New York, January 17, 1894. }

Pig Iron.—The market is quiet, although a somewhat better inquiry is noted. As yet the leading makers of Eastern Pennsylvania brands have not met the price made by the Lowmoor Company, although good Virginia Irons have sold for a considerable time below the prices named. It is understood the Lowmoor Company have not placed much iron for immediate delivery, but that they have placed quite considerable contracts for the near future. We quote standard brands, \$13 @ \$14 for No. 1; \$12.50 @ \$13 for No. 2; \$11.75 @ \$12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, \$13 @ \$13.50 for No. 1; \$12 @ \$13 for No. 2; \$11.50 @ \$12 for No. 3; \$11.50 @ \$12.25 for No. 2 Soft, and \$12.25 @ \$12.50 for No. 1 Soft. Gray Forge is \$11.25 @ \$11.75.

Spiegeleisen and Ferromanganese.—The market is very quiet. We quote nominally \$21.50 @ \$22 for 10 % @ 12 %, and \$25 @ \$25.50 for 20 %. Domestic 80 % Ferromanganese is selling at \$53 @ \$54, tidewater.

Billets and Rods.—Reports that an Eastern Wire mill has placed a large order recently are denied. About four weeks since a Wire mill in Eastern Pennsylvania did close for about 12,000 tons, which was captured by Pittsburgh, although an adjacent Steel works made a low price. We quote: \$19.25 @ \$20 for domestic Billets and \$27.25 @ \$27.75 for Wire Rods, tidewater.

Steel Rails.—It is reported that an Eastern mill has taken a number of orders, among which are counted one of 500 tons and another of 8000 tons to a New England road. The price continues \$24.80 at Eastern mill, tidewater delivery.

Track Material.—We quote as follows for small lots: Spikes, 1.70¢ @ 1.90¢; Fish Plates, 1.25¢ @ 1.40¢; Track Bolts, Square Nuts, 2.10¢ @ 2.40¢, and Hexagon Nuts, 2.30¢ @ 2.50¢, delivered. Concessions would be made for round lots.

Manufactured Iron and Steel.—No orders of any consequence have been placed and the contest for work continues with unabated fury. The Troy Iron and Steel Company announce a reduction in their A. I. W. Bars to 2.10¢ and in their B. B. brand to 2.30¢. Low

prices of material from Pittsburgh are being met by some of the Eastern concerns. We quote nominally: Beams up to 15 inch. 1.55¢ @ 1.75¢; 20-inch, 1.80¢ @ 2¢; 24-inch, 2¢ @ 2.25¢, for round lots; Angles, 1.55¢ @ 1.70¢; Universal Mill Plates, 1.50¢ @ 1.65¢; Tees, 1.75¢ @ 2¢; Channels, 1.60¢ @ 2¢, on dock. Steel Plates are 1.40¢ @ 1.55¢ for Tank; 1.60¢ @ 1.75¢ for Shell; 1.90¢ @ 2¢ for Flange, and 2.25¢ @ 2.50¢ for Fire Box, on dock; Refined Bars are 1.40¢ @ 1.9¢, on dock, and Common 1.30¢ @ 1.50¢; Soft Steel Bars are 1.40¢ @ 1.50¢; Scrap Axes are quotable at 1.6¢ @ 1.75¢, delivered; Steel Axles, 1.6¢ @ 1.90¢, and Links and Pins, 1.6¢ @ 1.80¢; Steel Hoops, 1.70¢ @ 1.90¢, delivered; Cotton Ties, 70¢ @ 72½¢ @ 45-lb bundle, at mill; Machinery Steel, 1.45¢ @ 1.50¢; Toe Calk, 1.90¢ @ 2¢ and Sleigh Shoe, 1.65¢ @ 1.75¢, delivered.

Old Material.—We note a sale of several hundred tons of Old Rails at a price equivalent to \$12, on cars, Jersey City. Old Steel Rails are offering at \$9.50 @ \$10.

Benjamin Watson, for many years connected with George A. Evans, has established himself at 33 Wall street in the business of purchasing and selling railway supplies.

British Iron and Metal Markets.

[Special Cable Dispatch to *The Iron Age*.]

LONDON, WEDNESDAY, January 17, 1894.

Early in the week there was some improvement in Pig Tin prices, due chiefly to covering of "bear" accounts, but prices subsequently reacted under the influence of free selling of cash stock and liberal offerings by importers. Outside speculation has been on a very limited scale. Latest dealings were at £71. 10/ for prompts and £72. 5/ for three months futures.

Copper has declined about 10/, selling at £41. 16/3 for Merchant Bars, prompt delivery. Meanwhile some recovery took place on covering of "short" accounts, but the market reacted on rather free selling of futures by regular dealers. Cash lots are now firmly held and speculators are very cautious sellers. Consumers are limiting purchases to immediate wants, owing to uncertainty as to the future and occasional pressure to sell by shippers. Late dealings were at £41. 15/ for Merchant Bar prompts, £42. 2/6 for ditto, three months futures, and £45. for Best Selected English.

Tin Plate prices are easier and the market is weak. Inquiries are small. At the quarterly meetings business was limited. Bessemer Cokes, 14 x 20, went at 10/3, and Ternes at 19/ for doubles, f.o.b. Wales. Liverpool prices are consequently somewhat weaker, with dealers quoting as follows:

IC Charcoal, Alloway grade.....12/3 @ 12/0
IC Bessemer Steel, Coke finish.....11/ @
IC Siemens.....11/3 @
IC Coke, B. V. grade, 14 x 20.....11/ @
Charcoal Terne, Dean grade.....10/6 @

Pig Lead prices have weakened to £9. 5/ for Soft Spanish, and the market remains very quiet.

Spelter has undergone little change in prices, although sales continue light. Sellers quote £16. 17/6 for ordinary Silesian.

There has been hardly any change in the Iron and Steel trades. Business is slow all through and prices are soft, although without radical change. Last transactions in warrants were at 42/11 for Scotch, 35/4½ for Cleveland, and 44/9 for Hematite.

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HARDWARE.

Condition of Trade.

THERE IS a perceptible increase in the volume of business, orders beginning to come in from the travelers who are in the field. There are many, however, who have not yet started out and many more from whom there has not yet been time to hear. Manufacturers and the large trade report many inquiries in regard to quotations and terms on considerable parcels of goods, indicating that the trade throughout the country are making careful preparations for the season's business. There is little to report in the way of prices, quotations being, as a rule, on substantially the same level as for some time past. There seems to be, however, a somewhat better feeling in some staple goods, and some well informed parties express the hope that the bottom has been touched and that the reaction must soon come, or at least that present prices will be maintained. On the other hand, the tone of the market in general Shelf Hardware is not especially strong. Some irregularities have been developed in lines on which prices have hitherto been pretty steadily maintained. An important feature of the situation also is the fact that there is a disposition among manufacturers to reduce wages, and in many lines reductions ranging from 10 to 33½ per cent., have been made. This influence, with the low prices ruling on raw material will naturally have the effect of reducing ultimately the price of the manufactured articles. The trade, recognizing this fact, are naturally indisposed to purchase beyond their early requirements, but with the better feeling prevailing in business circles are making their preparations for a fair season's trade. The fact that both manufacturers and merchants have unusually light stocks is an important factor in the situation, and many well informed Hardwaremen think that if business attains even a fair volume, the prices of some lines of goods may be strengthened on this account.

Chicago.

(By Telegraph.)

Jobbers note, as a peculiar feature of this season's trade, that while business for immediate shipment is smaller than usual their orders for future delivery are unusually large. A big movement is promised in Refrigerators, Wire Cloth, Poultry Netting, Screen Doors and Windows, Ice Cream Freezers, steel goods, &c. Shelf goods are nevertheless gaining in volume of business and the outlook grows more encouraging. It is generally believed that if the tariff question was to be settled decisively trade would become very active, as all stocks are light from manufacturers to dealers and consumers. Business in heavy Hardware is not so good as it has been and considerable complaint is heard of the falling off of business among the smaller manufacturers who are the customers of jobbers.

St. Louis.

(By Telegraph.)

Jobbers are more than pleased with the way orders have been received during the past week. The holiday lull generally lasts until after the middle of January, but this year has proved an exception. It is true sales are not large, but what they lack in size is made up in number. There is no special demand for any particular line of goods. Wire Cloth is beginning to move at \$1.45; Wire Nails are selling very low, \$1 30 in small lots being quoted. Barb Wire and Plain Wire are inclined to firmness. Collections, especially from the country, were never better.

Baltimore.

CARLIN & FULTON.—The year has begun with quite an active demand from some sections of the country for goods adapted especially to the preparations for another cotton crop; for while the great staples of agriculture may be below the cost of production, yet, with the hope of future improvement in prices, the planter tries his luck again and must have his plows and trace chains, his back bands and hames, his hoes and all articles incidental to the work.

We who are in this business of Hardware can congratulate ourselves upon one thing at least, which is that no matter how general trade may languish the bulk of its commodities can be classed among the necessities of the average consumer rather than as luxuries. The millions must be fed and clothed and housed, and to do it the farmer must have his implements and the mechanic his tools, and the consumption arising from a nation's

needs go daily on, while in the halls of legislation theories are put forth and discussed day after day until the public grows weary of the interminable and in many cases useless talk.

It seems to us that our greatest trouble is too much legislation, and it is a question whether political issues are not made more for the perpetuation of parties than for the benefit of individuals. Now we have the agitation of an income tax, the popularity of which among the masses is to be assured by its being applied to only those fortunate enough to enjoy an income in excess of \$4000. It matters not whether this income be the result of brain effort, as in the professions, or whether derived from real estate and merchandise already subjected to municipal and State taxation. The principle governing most laws of taxation seems to be that a man should pay because he can, not because he should. A statement was recently published showing the comparative tax *per capita* of this country and several European nations, which made a most favorable showing in favor of the United States, but there should have been also considered the fact that every individual in this country is also subjected to municipal and State taxation which, if also computed, would prove that we are a most heavily burdened people. There would be but little to complain of were assessments equitable, were no favoritism shown in exemptions, were legislation honest and were the moneys collected economically expended.

The success of the Hardware as well as of every other business requires from its State and national legislators intelligent and honest government; it needs a national bankrupt law as a protection against dishonest debtors; it needs the assistance and co-operation of salesmen who recognize the fact that an article which costs \$1 cannot long be sold at 90 cents, nor can the house afford to spend \$5 in traveling to gain \$4 in a sale; there must be a mutual co-operation between the employer and the employed for success in this as in any other business, and now at the beginning of a new year it is well for us all to think over these matters in order to have a successful future.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—*The Iron Age* of the 4th inst. contains fewer reports from the trade than usual, but those few have been of considerable interest. The philosophic spirit manifested is gratifying and encouraging. Philosophy is a good thing, but we hope it will not be deemed croaking if we say that the drafts made on the limited supply have in these last days been unusually heavy all over the country.

For ourselves, we have little to add to our last note. The jobbing trade generally have been getting themselves in shape to meet existing conditions. The fire insurance agencies complain of decrease of business growing out of the fact that all stocks are much lighter than they were a year ago. For many months every merchant has foreseen the present state of trade, and has given due attention to a judicious dim

inution of quantities and at the same time a maintenance of assortment.

The retail trade have shown a marked disposition to conform to the same lines, and it is almost certain that the volume of spring trade at least will be only sufficient to cover the actual needs of a community awakened to the necessity of a rigid economy in every direction.

Three months hence it will be soon enough to be making prognostications as to the crops, but farmers are still plowing, and as yet we have no report of any wheat "winter killed." Meanwhile we "possess our souls in patience."

Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—The past week or so has been very quiet in Jobbing Hardware circles, though perhaps no more so than might be expected of the first week in the new year.

Traveling salesmen, who were all in during the holidays, did not again "hit the road" until very recently, and the fact that trade was not solicited by these gentlemen had much to do with the paucity of the orders received. For the moment, then, buying by country dealers generally is on a conservative scale of the most pronounced type, and not without superficial evidence that the prevailing quietude has caused more than the usual economy in the consumption of goods.

While the general situation has improved, and while much of the feeling of distrust so noticeable not long ago has disappeared, still the indications point to a rather diminutive business for the balance of the winter. We base this expectation on the absence of any visible cause that might bring about any very great revival of trade. We are of the opinion that any decided revival in trade is unlikely to be experienced until some positive improvement takes place in the general business of the country. After the severe financial strain of a few months since it is not to be expected, under such circumstances, that trade can be immediately restored to its normal condition.

This strain, first felt by the money interests, has gradually in natural course reached the masses. Large numbers of people have in consequence been thrown out of employment, while others have suffered reductions in incomes to an extent that has made serious inroads upon the purchasing power of consumers. It is probable, therefore, that the volume of business will not show much increase until spring, when there should be a decided awakening, provided there is a reasonably good crop outlook.

Louisville.

W. B. BELKNAP & Co.—The new year starts out with no very flattering prospects, except that we believe a larger number of people are out of debt than have ever wished each other happiness in this part of the country. An immense number of debts have been collected or are in the process of liquidation, and very few new ones incurred, owing to the almost complete withdrawal of credits.

The fine open weather, the thermometer varying between 30° and 50°, the bright days of uninterrupted sunshine, has not only prevented an immense deal of suffering on the part of the poor in the cities, but permitted

what work might be done out of doors in the country to go forward, consequently a large amount of Wire is selling, both Plain and Barbed, and stock for ordinary improvements and repairs. Materials for the planting of next year's crop are beginning to move, also Trace Chains, Single Trees, Back Bands, &c.

There is no hesitation on the part of any one to buy at present prices, but as there is apparently no speculation in the air, nothing in excess of actual needs is ordered.

With the steady reduction in the price of Steel Billets, it was only natural that rods and steel bars should participate in the decline, and that the lowest prices ever seen on Wire, Wire Nails and Cut Nails, up to date are prevalent. There must be a turning point somewhere, and before the zero point is reached in prices, although the latter does not seem so very far away.

The rolling mills here are making part time and the car wheel shops and steam forge are running. Altogether the reports from our municipal boards in reference to the condition of the working classes of the city are very encouraging. There seems to be fewer people in actual distress and want than usual. Out of 50,000 bushels of coal appropriated by the Council, up to date only 17,000 have been called for. An effort to establish a free soup house, which might be denominated a help to mendicancy, received no public favor. There is an excellent spirit through the community of extending it by ordinary private assistance, and above all by giving work, which is most encouraging.

It looks to us on the present scale of prices as though the country were gathering itself together for a grand international business, as soon as the tariff question is once settled.

Boston.

BIGELOW & DOWSE.—It is difficult to note any marked improvement in business since the New Year. Retail dealers are busy this month with their inventories and their orders are confined to their immediate wants. The extreme low prices on Wire Nails have made many inquirers for prices and many orders have been placed for future delivery. The advance in price of Cut Nails by the Eastern mills is being well maintained. Orders for Wire Cloth are being booked for spring delivery and dealers are generally convinced that there will be a short supply late in the season. Salesmen are taking good orders for Window Screens and Screen Doors. Screens and Doors with a patented fly escape are meeting with great favor this season. Other than these the same Screens that met with favor last year are the favorites this year. In Screen Hinges the trade still hold to the cast in preference to the wrought Hinge.

The Bicycle Show in New York the past week marks the commencement of the trade for 1894. Previous to this manufacturers have been careful to whom they showed their new model machines, and they also were careful in making prices. This is ended now, and it is settled that a strictly high grade machine is to retail for \$125 this year, instead of \$150 last year. This grade machine has been greatly improved both in the finish and in the mechanism. Persons wishing a lower priced machine are easily accommodated with machinery ranging from \$110, down to \$75 at retail. Many of the manufacturers of the lower priced machines make claims that they are strictly high grade, and it is very difficult for any one, except he be an expert, to note the difference. Generally

discounts will be done away with and machines will be sold at net prices. The prospect now is that the medium grades, listing \$35 to \$25, will have a very large sale this season. During the next few weeks most of the large orders will be placed, and the trade looks promising for 1894.

General business is largely dependent on the mills running full time. This cannot be until tariff matters are settled at Washington. A customer informs us that the following notice of reduction is posted in a large woolen mill:

| | Per cent. |
|-------------------------|-----------|
| Salaried officials..... | 50 |
| Overseers..... | 20 |
| Help..... | 25 |

Still, this same customer is in the market to buy a carload of Screens and Screen Doors, a carload of Cut Nails, and also a carload of Wire Nails. Evidently the trade are expecting better times, and some are preparing for it.

New Orleans.

A. BALDWIN & Co.—Business is showing a considerable improvement in the beginning of the new year and, from the present indications, it looks as though we would do a larger business during the month of January than we did last year. The open winter that we have had is the cause of bringing a great many merchants to town, who are buying their spring stocks. They are simply buying for their immediate wants and do not seem to be making purchases for the future. The downward tendency of prices on the leading staples causes a great many of them to hesitate before purchasing, from the constant fear of not buying at the lowest market price.

The demand for spring goods is very heavy, and retail stocks must be considerably broken in this section.

Cleveland.

THE W. BINGHAM COMPANY.—January is half gone, but it is still too early to make any report for 1894. Travelers have been off the road since the first of the year working on inventory, pricing their new catalogues and getting ready for the spring campaign, and there has consequently been no communication with the trade except through the mail order department. Prices for 1894 are being received from manufacturers, and what changes there are are generally in the line of reductions. Wire and Wire Nails are still weak, with a slight demand. The outlook is for only a fair business this spring.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—The first half of January has passed in a very uneventful way with the jobbers of St. Paul. With nearly all of them it is stock taking time, and then comes the large amount of work and care in readjusting the stock to the wants of the new year, fixing the new prices, overhauling the working force in the store, and fitting out and instructing the traveling salesmen for their new duties. And thus the days have gone swiftly by, and now the stores and offices have settled down again into about their usual condition. The salesmen have taken their grips in hand and are in the field in about their usual force, each one anxious to convince all his customers that there are more or less good reasons for their buy-

ing his wares. Sometimes he doubtless makes life a little burdensome to the retail man, but after all has been said to his disparagement it must be conceded that the retail trade is greatly benefited by "the man of the gripsack." He is "a walking encyclopedia" of information in his lines, and in the few hours that he spends with his customer the latter is able to inform himself fully as to the markets and also as to what is going on in the commercial world, not only in the city but also in the local trade. In all kinds of weather, through sunshine and storm, and (still harder to bear) even amid the defeats by his rival, who with a glib tongue has succeeded in pocketing an order which he was sure of getting, he is still expected to come up smiling, and even to keep on smiling although his expected customer meets him with a chilliness that would do credit to a blizzard morning on the Dakota prairies.

The man of the gripsack is not an experiment nor an adventurer. He has come to stay, and on the ground of the great advantage that he is in the trade as well as generally on his own merit, he deserves and generally secures very cordial recognition and treatment from the trade, and as the years go by the appreciation of his value as an important factor in modern commerce will be more marked. It seems to us fitting at the beginning of the New Year to speak a word of commendation for the drummer.

As to trade, it is as yet light. Prices have not changed much, except in Nails and Wire, which have declined some, although the cost line to the manufacturer in both articles must have been passed long ago. Collections are now light and will be so till another crop is being marketed.

Philadelphia.

SUPPLER HARDWARE COMPANY.—

Finishing touches in the preparation for spring trade in the way of posting that vast and noble army of Hardware salesmen having been accomplished, and a start made in various directions for the scene of action, we now await the results, good or bad, as they may be. Many representatives it is true have only just left headquarters and have hardly had an opportunity for reporting as to the way the trade may feel after having missed the Hardwareman's visits during the past few weeks.

From the advance guard, however, the reports are probably fully up to expectations. The stocks in the hands of retail trade were probably lower at the time when salesmen's visits were discontinued for the Christmas holidays than has been the case for some years past. As a consequence it will, in many cases, be a necessity for want books as well as shelves to be scanned, and specifications given that empty corners be replenished, if even in a smaller way than of old, that customers' requirements may be satisfactorily met.

There seems to be little or no hesitancy in placing early orders for seasonable goods in quantities fully up to the average amount. Such items as Lawn Mowers, Poultry Netting, Barb Wire, Wire Cloth and Agricultural Tools are apparently receiving the usual attention.

An excellent opportunity is granted the trade at this season of the year, while pricing their stock, of comparing prices existing January, 1893, with those in force at the present date, showing that while many goods in which the cost of raw material figures extensively have suffered, there are

many items in which changes are not noted, or if they have been made, have been to a comparatively slight extent.

Nails and Barb Wire have suffered greater in proportion than any lines we recall that are handled by the Hardware trade. The decline in values of these staple lines is not only accounted for by the drop in the price of raw material, together with the reduced cost of labor, but also by the willingness of many mill owners to place their output regardless of profit, in order that they may do their share toward alleviating the suffering among their men that would likely follow were their forces thrown out of employment.

Among more recent changes in prices we might note a drop in price of Agate Ware, Wood Bench Planes, Strap and T Hinges, Shot, Wrought Padlocks, Horseshoes. Further, by comparing prices now in vogue with those of 12 months ago, we note declines of various percentages of Poultry Netting, Carriage and Tire Bolts, Bright Wire Goods, Coil Chain, Chisels, Steel Squares, Sledges and Heavy Hammers, Picks and Mattocks, Registers, Wringers, &c. The majority, however, are comparatively slight.

While the rule, where changes have been made, is of a downward tendency, there have been some exceptions, the latest of importance being in the line of Tacks, some manufacturers having already made two sets of advances since the year 1894 was ushered in.

During the season past the most noticeable among the advances have been in the lines of Auger Bits, Augers, Ship Augers and kindred lines, Hand Bells, Stocks and Dies, Safety Fuse, Trace and Fancy Chains and Wire Cloth.

Collections seem to be about on a par with those existing for the past few weeks, little changes for the better being noted.

Notes on Prices.

Wire Nails.—While the demand for Wire Nails has not set in in heavy volume there are decided indications of an improvement, and it is evident that the trade are disposed to supply their wants in the near future. A good many small orders are being received and the manufacturers have many inquiries from the jobbing trade and also from retail houses, which lead them to expect a fair volume of business before long. Prices are steadily maintained at former figures, the market being represented by the quotation of \$1.10 for carload lots at mill, with a concession of 5 cents on large orders. The mills are increasing their production and getting in shape for the anticipated trade, the year having opened with exceptionally small stocks on hand.

Chicago, by Telegraph.—The opinion gains ground that Wire Nails have turned the corner and that the lowest price for the present has been made. There is a constantly improving demand and sales are running along quite satisfactorily. The factory price appears to be gradually settling at \$1.20, Chicago, on the usual terms. Jobbers are selling at \$1.25 to \$1.30 from stock and report a very active inquiry from dealers for carload lots. This is reducing jobbers' stocks rapidly and is expected to help their prices.

Cut Nails.—The Cut Nail market, without having developed any special activity, seems to be in a somewhat better condition, and prices are slightly firmer. They are still represented by the quotation of 90 cents in carload lots at mill, but some of the manufacturers refuse to make this figure. Small lots from store in New York are held at \$1.20 to \$1.25.

Chicago, by Telegraph.—Trade in Cut Nails is growing heavier. Orders are not only larger, but specifications are coming in more freely than for several weeks past. The increased trade from districts hitherto occupied exclusively by Wire Nails continues to be a source of encouragement to the Cut Nail manufacturers. They are advised by jobbers that the demand for mixed carloads of Wire and Cut Nails is again a feature of the trade. Quotations on factory lots continue to be \$1.15 to \$1.20, Chicago, with concessions for high averages. Jobbers are quoting \$1.25 from stock.

Barb Wire.—The Barb Wire market is characterized by the same general features as for the past few weeks, there being no important change in price and no marked increase in the demand. Some of the manufacturers, however, while referring to the unprofitably low figures which are prevailing, express the conviction that the volume of trade during the next few months will be exceptionally heavy, there being indications of a large demand from several sections of the country. There is a good deal of unevenness in the prices made by the different manufacturers, some of whom are selling Galvanized Four Point at \$2.05 at mill, with 5 cents off in carload lots. Other manufacturers are refusing to meet this figure and are obtaining a considerably higher price. The inequality of the market is reflected in the fact that a prominent Eastern mill is quoting Wire at \$2.20, f.o.b. mill, and the Kilmer Mfg. Company, Newburg, N. Y., advise us that their price for less than carload lots is \$2.20, and in carload lots \$2.10. The manufacturers are pursuing a conservative policy with reference to contracts for future delivery, and refer to the probability that prices will be higher in view of the large demand which is confidently anticipated.

Chicago, by Telegraph.—Considerably more business is doing in Barb Wire. Contracts are now being made for the replenishment of jobbers' stocks, as they find a better demand from retailers throughout the West and Northwest. The market, however, is a little lower in consequence of the efforts of manufacturers further East to secure business in this territory. Carload lots are therefore quotable at \$2.20 to \$2.25 for Galvanized, while small lots from stock are selling at \$2.30 to \$2.40.

Horseshoes.—The Burden Iron Company, Rhode Island Perkins Horse Shoe Company, and Phoenix Horse

Shoe Company have issued revised quotations on Horseshoes, which represent a decline of 40 to 50 cents on former prices. They also have adopted a new policy, inasmuch as they now name a price f.o.b. mill, which is subject to no discount, abatement or allowance of any kind.

Strap and T Hinges—Owing to the active competition between the manufacturers of Strap and T Hinges the price of the goods has gradually been settling until the market is represented by the quotation of from 60 and 10 per cent. to 60 and 10 and 5 per cent., instead of the figures at which the goods have recently been sold. The Corrugated Strap and T Hinges of the Stanley Works are also selling at these prices.

Poultry Netting.—The market in Poultry Netting is characterized by animated competition among the manufacturers, and as a result exceptionally low prices have been developed.

Henry Disston & Sons.—Henry Disston & Sons, Philadelphia, under date of January 1, announce the following discounts for the season ending June 30, 1894:

| | Discount. Per cent. |
|---|------------------------|
| Inserted Tooth Circular Saws..... | 45 |
| Repairs..... | 45 |
| Solid Tooth Circular Saws..... | 45 |
| Shingle Saws..... | 45 |
| Cork Knives..... | 45 |
| Circular Miter Saws..... | 45 |
| Concave Saws..... | 45 |
| Grooving Saws and Slate Saws..... | 45 |
| Circular Saws for Metal..... | 45 |
| Seg. Veneer Saws 19 Gauge and Thinner..... | 35 |
| Segment Re-saws 18 Gauge and Thicker..... | 45 |
| Mill and Mulay Saws..... | 45 |
| Gang Saws..... | 45 |
| Pit, Whip and Futtock Saws..... | 45 |
| Ice Saws and Drag Saws..... | 45 |
| Cross-Cut Saws..... | 40 |
| Triumph Narrow..... | 40 |
| Great American Skew Back..... | 40 |
| One Man Saw..... | 40 |
| One Man Great American..... | 40 |
| “Champion”..... | 40 |
| Cross-Cut Handles..... | 45 |
| Cleaner Tooth Gauges..... | 45 |
| Combination Cross Cut Tool..... | 25 |
| Saw Mandrels..... | 25 |
| Saw Gummers and Cutters..... | 25 |
| Emery Wheel Gummers..... | 25 |
| Punch Gummers..... | 25 |
| Hand Shear..... | 25 |
| Swages..... | 25 |
| Tools for Repairing..... | 25 |
| Saw Sets..... | 25 |
| Machine for Sharpening Inserted Teeth..... | 25 |
| Saw Sets and Side File..... | 25 |
| Saw Clamps..... | 25 |
| Star Saw Set..... | 25 |
| Wire Gauges..... | 25 |
| Band Saws ¼ inch to 1¼ inches wide..... | 40 |
| Band Saws 2 inches to 12 inches wide..... | 50 |
| German Webs..... | 25 |
| Fay Webs..... | 25 |
| Doctor Blades..... | 25 |
| Felloe and Turning Webs..... | 25 |
| Hand Saws, all kinds..... | 25 |
| Pruning Saw..... | 25 |
| Hand Saws with Gauge..... | 25 |
| Compass and Keyhole Saws..... | 25 |
| Back Saws..... | 25 |
| Wood Saw Blades..... | 25 |
| Framed Wood Saws and Bucks..... | 25 |
| Wood Saw Rods..... | 25 |
| Butcher and Hack Saws..... | 25 |
| Dehorning Saws..... | 25 |
| Butcher Saw Blades..... | 25 |
| Plastering Trowels..... | 25 |
| “Standard” “..... | 25 |
| Cane Knives..... | 25 |
| Post Hole Diggers..... | 25 |
| Pruning Hook and Saw..... | 25 |
| Brick and Pointing Trowels..... | 25 |
| Saw Handles and Screws..... | 25 |
| Machinists’ Squares and Bevels..... | 25 |
| Slaw and Kraut Cutters..... | 25 |
| Barker’s Butts..... | 25 |
| Machinists’ and Carpenters’ Iron Try Squares and Bevels..... | 25 |

| | |
|------------------------------------|----|
| Try Squares and Bevels..... | 50 |
| Mortised Gauges..... | 50 |
| Screw Drivers and Ferrules..... | 50 |
| Plumbs and Levels..... | 50 |
| Trammel Points and Plumb Bobs..... | 50 |
| Superfine Files..... | 30 |
| “Vautier” Tools and Files..... | 30 |
| Files and Rasps..... | 70 |

They refer to the fact that their factory price has been firmly upheld and has proven satisfactory both to the trade and themselves, and to secure the maintenance of their prices throughout the trade, they announce at the close of the season an extra discount on certain goods to houses who maintain the factory price.

Hinge Cover Square Can.—The Record Hinge Cover Square Boxed Can, manufactured by Record Mfg. Company, Conneaut, Ohio, and illustrated in our issue of January 4, 1894, is sold at the following list, subject to a discount of 50 per cent. :

| | |
|-------------------|--------|
| | Each. |
| 1 gallon can..... | \$0.50 |
| 5 “ “..... | 1.00 |

Hat and Coat Rack.—The Derby Hat and Coat Rack illustrated in *The Iron Age* January 11, 1894, for which the American News Company, 37 to 41 Chambers street, New York, are agents, are sold at \$2 per dozen, 30 days net, alike for all sizes.

Animal Pokes.—A. W. Bishop, Berea, Ohio, announces the following revised prices on his Animal Pokes:

| | |
|--------------------|------------|
| | Per dozen. |
| American..... | \$2.65 |
| I X L..... | 5.75 |
| Steel Monarch..... | 4.50 |
| Pioneer..... | 3.50 |

Glass.—The question as to whether all Glass factories will shut down February 10 is an interesting one to all engaged in the Glass trade. At a meeting of manufacturers held last week in Pittsburgh this action was unanimously adopted, although but a limited number of manufacturers were present at the meeting. The action of the meeting, it is stated, is not to be binding upon the individual manufacturer unless 85 or 90 per cent. of the pots available for operation can be induced to unite in the movement; and this is considered doubtful. In connection with the meeting the following statements were brought out: Approximately there are \$5,000,000 invested in American window Glass factories; also, that there are about 2400 Window Glass pots in the country, of which 500 have been abandoned, leaving 1900 fit for operation. Of the latter number 1130 are now in operation. Counting all the workmen connected with the factories, it requires about 10 men to a pot, so that the shutting down would throw a large number of workmen out of employment. Stocks of glass in manufacturers’ hands are small, and those whose factories are running have no trouble in supplying the demand. Pittsburgh reports quote 85 and 10 and 5 per cent. discount for single, and 85 and 20 per cent. discount for double strength, as the lowest prices being made from

factory. A New Jersey manufacturer refused an offer of 85 and 7½ per cent. discount for a carload of single strength Glass, but accepted the order at 85 and 5 per cent. discount. It is reported that a Western firm recently quoted Glass at 85 and 20 per cent. discount, f.o.b. Baltimore. The foregoing represents the variation in prices in different parts of the country. In Plate Glass circles it is understood that a quiet understanding is in operation among three or four of the larger Pittsburgh firms, which has had the effect of checking the downward tendency of prices to some extent.

The Hardware Club and the Hardware Dinner.

AS ANNOUNCED in our last issue, it had been determined to hold the usual dinner of the Hardware trade on the evening of February 27. Our readers will therefore be surprised to learn that the Board of Governors of the Hardware Club, at a meeting held January 12, decided without a dissenting voice to reconsider this decision and give up the dinner this year. Their action is shown in the following preamble and resolutions adopted at that meeting:

Whereas, there is at the present time much distress among the working classes as the result of the disturbance of business during the past year, and as a consequence many appeals for charity are being made; and

Whereas, it is desirable that on the occasion of the opening of the club rooms in the Postal Telegraph Building, which will soon be completed and ready for occupancy, there should be a suitable reception or banquet for the members of the club and their friends in the trade; therefore

Resolved, That the annual dinner which it was decided should be held on the evening of February 27 next be deferred or given up, and that in its stead there be, when the club comes into possession of its rooms, a suitable formal opening which will bring the members of the trade together and serve many of the purposes of the usual annual dinner.

Resolved also, That the Board of Governors recognize the earnest call which is made upon them and upon the trade at large for the relief of the existing distress among the industrial classes through the channel of individual liberality, which will in their judgment be facilitated by dispensing this year with the usual dinner, and each devoting the expense of the same to charitable purposes.

The trade generally will recognize the force of the considerations which led to the above action, which we are confident will meet their hearty approval, in view of the fact that there is much want among the working classes, not only of New York, but of other manufacturing points, and especial efforts are being made for their relief. Several large dinners of other organizations have already been abandoned, and in some cases special arrangements made by which the expense of the dinners could be turned directly into charitable channels. In the case of the Hardware dinner it is not feasible to do this, but the trade

will appreciate the force of the suggestion in the resolutions above, looking in the direction of individual liberality. In times like these, when the country, especially the manufacturing sections, are feeling the effects of the disturbance of business during the past year, it is certainly more appropriate that help should be extended to those who are in want than that the well-to-do should enjoy a relatively expensive banquet. The thoughtfulness of the officers of the club in taking this action will, it is hoped, result in the bestowal of no inconsiderable sums for the relief of the existing distress.

This year also there is apparently less necessity than there has heretofore been for holding the usual dinner, inasmuch as before long the club rooms will be opened, when there will be a coming together of the trade of the city and vicinity, which will doubtless be an occasion of especial interest and enjoyment.

The Mischief of Long Credits.

THE EXPERIENCE of the trade during the past half year is likely to lead to some reforms in business matters which will lay the foundation for a better prosperity. For months manufacturers and merchants have recognized the necessity for scrutinizing credits closely, and it is a well-known fact that some of the large jobbing houses have spoken very frankly to their retail customers, suggesting that perhaps they were buying in too large quantities and expecting to have too long time for payment. The result has been that credits in many cases have been shortened, and instead of selling goods on three or four months' time the terms have been made 30 or 60 days, with a further inducement in the way of an attractive cash discount for immediate payment. In some sections of the country the extended credits which have prevailed have unquestionably contributed not a little to the depression and disaster which characterized the closing half of 1893, the effects of such a system in times of financial disturbance being far reaching. It is probable that in comparatively few sections of the country is the credit system carried to the extent referred to by one of our correspondents, who alludes to the fact that goods sold in January are usually not paid for until the fall and winter following, but many merchants have on their books accounts which run for even a longer time.

We have frequently discussed the question as to the desirability and feasibility of conducting the Hardware business on a cash basis, and have explained the methods adopted by merchants to accomplish this end. The interest which has been taken in such discussions shows that the trade recognize the usefulness of information as to how the present condition can be improved and the measures which

other merchants have adopted. In this connection we take pleasure in laying before our readers the following circular, issued by Ben J. Schuster, Selma, Ala., in which he refers to the mischief of long credits, and announces the policy which he will hereafter adopt:

To My Friends and Patrons: With the close of the present year the lesson taught by costly experience would warrant a glance into the future. The country has witnessed the most disastrous business depression that has ever befallen a nation. Failures followed by failures and ruin have paralyzed the channels of trade, caused by a culmination of circumstances too varied to discuss except as pertains to this immediate section. The paramount cause is the old system of long credit, with which any business will sooner or later be brought to disaster. All must succumb to the inevitable fate. The remedy, then, must be applied before the disease has eaten too far into the vital parts.

In the coming year I shall be prepared to serve my customers, but upon a different and more solid basis. I have laid in a very large supply of seasonable goods, bought at low prices, which I will be pleased to sell at a corresponding price, but at terms strictly 60 days, or 2 per cent. cash 10 days. No deviation whatever from this, and I will make it to your interest to purchase from me at these terms and prices. A business cannot succeed selling goods in January payable the following fall.

Trusting you will appreciate this effort of mine to reform our present incorrect system of transacting business, which must in the end result beneficially, thanking you for your past favors and soliciting a continuance thereof upon the new system only, I am, &c.

Peddlers and Good Goods.

A GENERAL IMPRESSION prevails that peddlers who go through country districts disposing of their wares usually carry cheap and worthless stuff. That this is not always the case is indicated in the following letter from a Western Hardwareman:

We have quite a trade with peddlers, those who carry their stock around in a valise and those who travel with a wagon, and this fact surprises me—they want good goods. You would not look for that, would you? I did not. I used to take them to the Cheap John counter, supposing that price was the only thing in which they were interested, but I soon learned my mistake. If the line is Tinware, they want good Tin. If it is Cutlery, they want good Steel. If it is notions, they want first-class Pens and Pencils. They talk about their trade just as you would talk about yours; that goods must be good or they cannot go over the same route the second time.

ATLAS TACK CORPORATION, 31 Warren street, New York, sustained considerable loss by fire and water on January 15. The cause of the fire is unknown, but it was discovered about midnight on the Warren street side. The office was wrecked and goods injured on the main floor and in both basements. The store runs through to 27 Murray street, and as this portion is uninjured they have established an office at that end and are receiving and executing orders, &c., sending the

goods from fresh stock forwarded direct from factory.

Asking Good Prices.

THE DEMAND of the public is unquestionably in the main for low prices and the store that offers bargains will, as a rule, have the largest trade. That there is something in asking high prices for goods of high quality is intimated in the following suggestion from an experienced Hardwareman:

There is a certain class of consumers who do not buy of the Hardwareman because he does not ask enough for his goods. They go to the fancy stores and to the jewelers. They are the people who want high grade Cutlery—Knives, Razors and Scissors. They have an idea that such goods must necessarily be expensive, and when they are asked ordinary prices they think the goods cannot be the best, and it is the best that they are after.

A woman just now wanted a 7-inch Scissors. I asked her 75 cents, and showed her an excellent brand. "I want something better than that," she said. Now, she is no judge of the quality; she is not complaining of the finish; she simply believes that a fine quality article cannot be sold for that price. So with some men buying a Razor. They hear barbers talking about their Razors being worth \$5, and they believe that a really good tool cannot be sold for \$1.50. What shall the dealer do? The wise thing is to have a small assortment of fine finished goods for this class, and as the sale will be slow the dealer will be justified in asking all the profit he can get. Then, when he has a customer whose idea of "something better" is something that costs more, he can suit him and make money by it.

Signs of Becoming Rich.

"I ASKED A MAN who was worth a great many more thousand dollars than I am worth cents," writes a well known Hardware traveler, "what were the first signs to him, from the outside world, of his being rich. I knew that he began with very little, had lived right along in a plain way, making no show of wealth, and I was curious to know how the public made him aware that it knew him to be wealthy.

"I think," he answered, "that it first came to me in the way of prospectuses. When the first two or three were received I accepted them as I would a business circular, taking it for granted that some one had a Dun or Bradstreet and made his list from that. But I began to get them from sources outside of this, and then it came across me that, in some way, it was known that I had a little money. Following soon after this I was persuaded to take a little stock in an incorporated company, and, much to my surprise, I was elected a director. This seemed to be the signal to the world at large that I was a man of some means, and everybody with a little scheme promptly honored me with his acquaintance. I knew then that the little world looked upon me as a rich man, and overestimated my riches. But I have answered your question."

Methods of Advertising.

BY D. C. FOOTE.

AFTER many years of experience in the Hardware business and its various branches, one may begin to realize some of the qualities and methods required to build up and extend a business that shall be both substantial and remunerative. To be thoroughly successful one must have a liking or adaptation to the business, for while to the uninitiated it may look easy, not every one can conduct a Hardware store and make it pay; at least not without some previous training for their chosen vocation.

While one must be governed in methods by his location and trade, yet there are a number of general principles that may influence the extension of one's business by increasing the demand for the merchandise which is offered for sale. Advertising in the local papers, if judiciously done, may be considered one of the most important means to this end. The writer believes that ordinarily a brief statement of the facts concerning the goods to which one wishes to call attention is better and has a more lasting effect than an elaborate or overdrawn statement or one of too many words.

CUT IN PRICES.

A cut of the article or articles advertised is a great factor, especially in this line of business. The advertisement should be changed as often as once each week, each succeeding advertisement being more attractive and novel than the former, if possible, for when an advertisement becomes stale it is a waste of printers' ink. One of the best advertisements of Hardware that I have ever seen was used by an energetic firm who do an extensive and growing business in Southern Michigan. This consisted of a cut of some leading event of the day, with a few words relative to it leading to some special article for sale. This was changed nearly every week with a new cut, and when displayed near the column of local news was always observed and while occupying a small space always hit the mark. The cuts were obtained of a firm who make this work a specialty—suited the cut to the advertisement desired.

NEWSPAPER ADVERTISING

is an art which evidently had never been cultivated by the firm who had furniture to sell and also combined undertaking with their business, and who, wishing to call attention to their bargains in furniture, headed their advertisement in bold type: This will interest you; and following this announcement with the cut of a hearse. A student in Yale College is fitting himself especially for writing newspaper ads, finding in it a field both congenial and remunerative, and when cultivated talent is used for this purpose one may expect to reap results accordingly: Hood, Wanamaker, and a host of others attest by their success the power of the pen to extend busi-

ness. One Hardware jobbing house is pinning its faith to this method by investing \$50,000 in advertising a special make of Bicycle, which will doubtless make it one of the leading wheels. This enterprise in advertising may be used by retail dealers on a reduced scale to advantage.

Advertise, advertise.

Art in asking him who buys

There the merchant's secret lies.

Advertise.

Circulars, while often cast aside as of minor importance, yet serve in their humble capacity to arrest if not hold the attention of a customer, and often form the connecting link in the chain which binds a bargain. But how most efficiently to use them is the question. To distribute them from door to door is antiquated and unsatisfactory, and in many of the larger cities is justly prohibited. The best way to dispose of circulars and other printed matter is to have a box of suitable size in which to arrange and classify them, placed conveniently near the wrapping counter, and when goods are done up, neatly insert in the package such circulars as would be of interest to the customer. This is the most delicate and effective way of using them and often proves a good investment for the trouble. There are other ways of using them, but the writer has found this the best solution of their disposal.

CUNNINGLY DEvised.

One of the most unique and striking advertisements was recently used by an enterprising Hardware firm in one of our leading cities, as follows: There appeared in the daily paper an advertisement that this firm would give away 500 gas stoves, and those desiring to secure one should call and see a sample of the stove and leave their names and the stove would be delivered on a certain day. It was a one-burner stove which usually retails for \$1.50 and was really a desirable article. No such generosity had ever been heard of before in a business way and, as may be imagined, the people came with a rush and kept the clerks busy taking their names till the desired number was reached. Of course, to give away 500 stoves without any benefit to the donor could hardly be expected. The rubber tubing used for connecting the stove, which was required to be purchased of the firm, partially paid the investment, while the demand created for the ovens, broilers and other furniture to complete the outfit reduced the loss to a minimum if it did not in the end leave a profit by creating a future demand.

A CHEAP CATALOGUE.

A photographic reprint of a large Hardware catalogue reduced in size to 5 x 6 inches and about 2 inches thick, containing over 1200 pages, bound in red cloth, was recently made by a large jobbing house, leaving out their name entire and inserting the name of the retail dealer, to whom it was sold at a cost of 30 cents per volume. This distribution to the cus-

tomers of the retail dealer was highly appreciated and is one of the most permanent mediums of advertising that has ever been originated. Where one has seasonable novelties in the house furnishing line to sell, a large special postal card, containing cuts and descriptions of articles, mailed to prospective customers, often brings purchasers.

STOVES.

One of the the most important articles in a general retail Hardware store is stoves, an article in which there is usually severe competition, and their successful sale depends much upon the method used in showing them. The writer believes the model way to show them is to have a room separate if possible from the general store, and this attractively furnished, walls papered, floor carpeted, and supplied with chairs for the comfort of customers. The stoves exhibited, thoroughly blacked and polished, should be arranged on large caster trucks so as to easily handle them before a purchaser. When a cooking stove of unusual merit is being offered an exhibition of its baking qualities might be given, and an announcement of such an exhibition made in the local paper, stating the day and hour and inviting those especially interested to come and witness its merits as a baker. This same idea might be followed up with many other lines of goods, mantels and grates, Builders' Hardware and many things in the house furnishing line where the size of the town or city will permit of it, and even in small towns one would find this method profitable.

DISPLAYING GOODS.

There is nothing that will do more to keep pace with the times than the proper displaying of goods. The front windows are a most important part of this feature, and cannot be overestimated. A man may be clothed in the most fastidious manner and in the latest fashion, but if his face be grimy and unshaven it will mar the whole and no one will remember anything but the face. So it is with the store. The office and the goods on the shelves may be in good order, but if the show windows are dirty and used for storage rather than display the effect is depressing on the observer; while on the other hand, a window that has a clean front, with goods attractively displayed, will often cause a passer by to stop and look, with many chances of his becoming a purchaser. It is not in the province of this discussion to make suggestions as to how most attractively to dress a window with Hardware, but when dry goods and other stores find it profitable to pay good salaries for special work of this kind, it should not fail to interest those who are desirous of extending their trade.

CLERKS.

The arrangement of the store should be as automatic as possible. The wants of the customer should be responded to without any bungling by experienced clerks, who are thoroughly

posted in the routine of the business of their special department. Too little attention is given to the old proverb, "Knowledge is power," for therein lies the sequel for a successful salesman, and as he is the motive power which propels the craft, it behooves the commander that his crew are well instructed and thoroughly drilled, for upon them depends his success or failure. Where more than four or five clerks are employed I believe it a most commendable plan that they be made thoroughly conversant with any new or special article purchased. This can be done by the buyer, who obtains his points from the traveler, or by the traveler himself. Suppose a new kind of lawn mower has been purchased. Call the salesmen together at a convenient hour, say immediately after closing, if no other convenient time can be found, and spend a half hour, or even less, in exhibiting the special points of the mower—dissecting its parts and comparing its points with those of other manufacturers. Encourage comments by those present as to their ideas regarding the superior or defective points. This could be made a social evening, if thought best, with light refreshments, with papers previously prepared upon any special article relative to the trade, or debates might be given on such questions as—Resolved: That cut nails are better for general use than the wire nail, or that hot water heat is superior to hot air for heating houses of moderate size, &c.

FAMILIARITY WITH GOODS.

The writer has often found points gained by overhearing a traveling man who was well posted dilate upon an article he was selling invaluable in selling the same thing to the retail customer, and if this be true in one case, why not in all? When we know a thing absolutely, with what confidence we proclaim, and hence impart our faith to the hearer! A response to the demands of one's trade as to the class and kind of merchandise required to meet its wants is necessary if one would do a healthy and growing business. To be continuously out of an article for which there is a frequent call, thus allowing custom to drift to one's competitor, is a poor way to extend business in the right direction. To study the style and class of goods best calculated to please is an opportunity not to be overlooked. It is said that John Jacob Astor once foreclosed a mortgage which he had on a stock of millinery in New York City because the interest was not paid; after matters were adjusted the business was continued with Astor as a partner. Passing through Central Park one might have noted the millionaire leisurely sitting on one of the Park seats carefully observing the bonnets of the most stylishly dressed ladies out for their promenade; any head gear of a peculiar or fascinating style was fully noted and reported to his head milliner. The consequence was that business grew, and two men have since retired from

the business worth \$10,000,000 apiece. I have said nothing about the power of personal solicitation, but will close by quoting from the rules of a well-known Hardware firm:

"Go for business in every direction, in the store and out of it; wherever you see a chance to make a sale work for it with all your might."

Bicycles for 1894.

FIFTH ARTICLE.

Bicycles and the Hardware Trade.—The reduction of list prices in Bicycles for the season of 1894 is introducing uncertainties in the trade which have not confronted dealers in former years. Manufacturers more than ever before are recognizing the retail Hardware dealer as the best medium to put their machines before the public, while the jobbing trade who handle these goods and manufacturers' agents in this line will offer Hardwaremen the exclusive sale of their wheels in each town in preference to agents. The competition in the field, especially from small concerns working on borrowed capital, resulted in machines being sold last season to many irresponsible parties, because of the manufacturers' anxiety to get their Cycles before the public. The stringency of the times and the losses which were inevitable as a result of this mode of conducting business have apparently weeded out much of this kind of competition. This suicidal method of doing business appears to have been from a desire to sell machines, rather than the result of overproduction. There is likely then to be a close scrutiny of credits this year, and a selling of machines only to parties who are known to have the wherewithal to pay for them. High grade machines are listed for 1894 from \$100 to \$160, and the jobbing trade is likely to vary discounts to different customers, as they do on other lines of goods. The retailer will probably make his selling price in proportion to the discount he receives, which will naturally cause a variation in the price of the same machines in adjoining towns. The aim of the manufacturers is doubtless to produce the best machine for the least money, which will be, of course, an advantage to the producers. Retailers, it is understood, are generally slow in placing orders, while manufacturers anticipating a large trade later in the season are turning out machines to be ready for the demand when it comes.

E. C. STEARNS & Co., Syracuse, N. Y., list their 1894 pattern Models A, B, and ladies' machine, Model C, at \$125, in response to popular demand. The company assure the cycling public, however, that in no degree has quality or finish been sacrificed. Stearns' Special, with light road tires, weighing 21½ pounds, lists \$150. Stearns' Racer lists \$160, and Stearns' Tandem \$225. Models A, B and C weigh 26, 32 and 27 pounds respectively. The weight of the racer, which is known as the Yellow Fellow, will be announced by the manufacturers later. They say, however, that the wheel will be surprisingly

light, and further remark that they have made a study of lightness in Bicycle construction, and that in this racer they will offer a practical track wheel of ample strength and rigidity combined with light weight. The Special, weighing 21½ pounds, is referred to as having been ridden for several months by men weighing 170 pounds, and as having been thoroughly tested on a corduroy road. The company expect to put out a limited number of the Tandem machines, which have graceful lines and weigh 38 pounds.

THE DEMOREST MFG. COMPANY, Williamsport, Pa., with New York office at 17 East Fourteenth street, are making eight styles of wheels for the coming season. The Latest, is a strong wheel for its weight, having double frame underneath, the tubing being ⅝-inch, reinforced by their new method which, it is claimed, adds 50 per cent. strength without adding weight. The tubes are brought from the head and spread to the extreme outside of the crank hanger, thus giving it support and supporting the strain when pedaling, especially when hill climbing. Another feature peculiar to the machine is the company's new locking device, enabling the rider to support his wheel, after dismounting, against a wall or other support without its falling; the locking device, it is stated, adds no weight to the wheel. This machine weighs 28 pounds, and lists at \$150. The Latest racer is built on the same principles as the foregoing, but is fitted with Palmer racing tires, scorcher saddle, &c., is built of lighter tubing and weighs 25 pounds. The Columbus gentlemen's wheel is the same as last year's Columbus with the exception of the frame, which is raised 1 inch. The wheel as now made weighs 32 pounds without brake, and lists at \$125. The Columbus ladies' will be made with straight lines, as the manufacturers consider this to be the strongest way to make a frame for ladies' use, as a straight hollow tube in their estimation will stand much greater strain than a curved one. This wheel weighs 35 pounds and lists at \$125. The Columbus combination is graceful in appearance, convenient for use, and lists at \$125. The company also have the New York in three styles: gentlemen's, ladies' and combination, each listing at \$100. The weight of these wheels is 35 pounds, and they are referred to as being fine machines for the price. The makers state that their wheels are built with the parts all interchangeable and that the utmost attention is given to material, workmanship and finish in general.

NATIONAL CYCLE COMPANY, Fitchburg, Mass., will manufacture but one model of the National, designed for road riding, which weighs from 28 to 30 pounds and lists at \$150. The National is a chainless rear driving Bicycle, propelled by bevel gears, protected by dust proof covers. The frame is of the Humber diamond pattern of single tubing.

THE ARIEL CYCLE MFG. COMPANY, Goshen, Ind., are placing on the market for 1894 the Ariel roadster, listed at \$150; the Ariel light roadster, listed at \$150; the Turtle, listed at \$150, and the Titania, a woman's Bicycle. All Ariel Bicycles are fitted with Palmer or Morgan & Wright tires, as desired. The Ariel roadster has high or low frame, two 28-inch wheels, dust proof ball bearings all over, high or low handle bars and cork handles, patent non-slipping brake, and patent American dust proof gear case. The specifications of the Ariel light roadster are similar to the foregoing, with gear 60 to 72-inch, regular gear 64-inch. The Turtle, a racing machine, weighs, all on, less than 21 pounds, has long, deep

frame, and is fitted with wooden rims, Palmer racing tire, racing saddle, tapered rat trap pedals, 7-inch cranks, Ariel ball bearings all over, short, low handle bars, 66 to 72-inch gear, and is finished in black, maroon or aluminum. The Titania weighs, all on, 32 pounds, with mud guards off 20 pounds. It is built with hollow or wooden rims, weldless tubing throughout, every joint carefully reinforced. The position, it is stated, is absolutely correct; the chain is protected by their patent gear case, and the dress prevented from contact with the wheels by silk lace guards. The frame is of the straight lined pattern, and the whole machine is finished in maroon or black enamel and nickel, and is light, strong and graceful. The catalogue issued by the company is artistic in design, having on the front cover a colored representation of knights of the ninth and nineteenth centuries. The interior of the book is devoted to illustrations and descriptions of their wheels.

THE KEATING WHEEL COMPANY, Holyoke, Mass., will retain the main points of their model E '93 wheel, strengthened at points that the year's experience has shown them would improve it, and, in addition, for 1894 they will make a deep frame machine for extra tall riders. The wheels will be built on Humber lines, of imported weldless tubing, black enameling, with both steel and wood rims and detachable tires. The racing wheels will weigh 21½ pounds and the ordinary roadsters from 26 to 29 pounds. The ladies' wheel will be one of the double deep frame pattern, graceful in design and light for a ladies' machine, weighing only 27 pounds. The makers claim for this wheel especial beauty, strength and speed. They will also make a straight line ladies' wheel, which is referred to as almost a combination, as a gentleman could ride it without being accused of having a ladies' wheel, while a lady could ride it as a distinctive ladies' wheel. This wheel weighs but 27 pounds, all on. The company will list their wheels at \$125, with additional charge for special light racers and specially built wheels.

THE HARTFORD CYCLE COMPANY, Hartford, Conn., will have seven models for '94 ranging from \$75 to \$100. list. The pattern H of the Hartford safeties is made with straight tubing to give strong construction, with 43-inch wheel base, and geared to 55 inches. The machine weighs 36 pounds and lists at \$100. Pattern G has diamond pattern frame, long steering head, 44-inch wheel base, geared to 63 inches, weighing 32 pounds and listing at \$100. A high frame pattern G will also be made, identical in construction with the regular pattern, except that the frame will be 3 inches higher from the crank shaft to the seat rod bracket. Pattern E has elliptic sprocket, geared to 62 inches, with 44-inch wheel base, weight stripped, with light saddle, 35 pounds, listing at \$85. Pattern F has a loop pattern frame of single tubing, elliptic sprocket, 42-inch wheel base, weighing 43 pounds, listing at \$85. Patterns J and K are intended for boys and young girls, the material and work being the same as is put into the other patterns; these machines list at \$75.

STERLING WHEEL WORKS, Chicago, offer a line consisting of six Sterling machines for the coming season. The Sterling racer is made of Mannesmann tubing, and will be fitted with wood rims and Palmer racing tires. This is a track machine, but can be used on first-class roads by experienced riders with a slightly heavier tire. The machine weighs 19 pounds, listing \$160. The Expert model E is built of the same tubing, special steel forgings,

Sterling patent corrugated hubs; fitted with either Palmer, G. & J., or Morgan & Wright tires at the option of the dealer; either wood or hollow rims, and will weigh from 25 to 29 pounds, depending upon the equipment of the machine as to saddle, rims, tires, &c. The wheel lists at \$135. The Expert model D is the same machine except in size of frame, which is made somewhat lower in order to accommodate the large class of younger riders who are unable to reach a higher frame. This wheel also lists \$135. The model E full roadster is practically the Expert machine with heavier tires, and with brake and mud guards. This machine will weigh when full rigged and with heavy frame, probably not over 32 pounds, and can be reduced to 29 pounds by the use of wood rims, &c. The flexible guard is of special design and will weigh but 4½ ounces. This wheel lists \$135. Model F, which is called the ladies' Sterling, is made especially light, with wood rims only and light Morgan & Wright tires. This machine is comfortable to handle and lists \$135. The Sterling Model B, their business buggy as they call it, is a heavy roadster for rough use, and is designed for great strength. The manufacturers state that there are a large number in use by contractors and mechanics, who use them freely in going to and coming from their business. The list of this machine has been reduced from \$150 to \$100, so as to put it within reach of a large class who would otherwise be compelled to pay considerable more for a high grade machine. Special features include the corrugated hub, so designed as to get a direct pull and avoid bending the spokes, which are also tangent. The convertible pedal is so arranged that every rider is provided with a pair of extra blades for substitution of the rubbers of the pedals, when desired, thus providing a pedal for racing or scorching, as well as a regular rubber pedal for ordinary use. The changeable gear which proved satisfactory during '93, will be furnished with all machines. This consists of a supplemental rim attached to the sprocket, which gears the machine to 67 inches. When wishing to reduce the gear to 60 inches, four screws are removed from the sprocket, and the rim will come off over the pedal and crank without any trouble. The driving strain is removed from the screws that hold the two wheels together to the lugs on the rim which fit into the sides on the main sprocket. Their new crank made of tool steel and oil tempered is attached to the shaft by a special device, which makes it easily detachable whenever necessary.

CURTIS-CHILD MFG. COMPANY, Philadelphia, formerly the Bretz & Curtis Mfg. Company, offer a line of solid comfort saddles for the coming season, embracing a number of different models and several styles of finishing. Model A, the men's racer, has a new pattern seat post clamp device, making it possible to fit any size seat post. The frame on which the leather is attached is a simple design and a genuine steel stamping. The saddle weighs 13½ ounces, and has a tilting device, which is referred to as a novelty for this style of saddle. Model B, the men's scorcher, is quite like the 1893 pattern, with improvements in the leather top, which has been shortened and made narrow. The coil spring is slightly heavier and shorter, and the shape of the flat spring is also somewhat altered. The post bracket is of an entirely different pattern from the '93 design, and does away with the protruding top bolt. The new clamp will fit any size of seat post, and is made from the best drop forged steel. The weight of the saddle is 26 ounces. Model C, the steel racer, is entirely

new, being made of metal. Such a saddle has the advantage of always keeping its shape, not sagging or getting sticky and unpleasant in hot weather and weighing but 12½ ounces.

In the Model D, the ladies' roadster, the leather comes well over the springs in front to make it impossible for the dress to catch. It weighs 24 ounces, is neat in appearance, adjustable, and has a tilting device. Model E, the boys' racer, is identical with model A, except that it is made smaller throughout. It weighs 11 ounces, and is designed for 24 or 26-inch boys' Bicycle. The Model F, boys' scorcher, is the same pattern as Model B, except that it is comparatively smaller, to make it suitable for a boy's machine with 24 or 26-inch wheels. Weight, 21 ounces. Model G, the Favorite roadster, is described as having a special top correct to a fault, and its proportions as consistent with a thoroughly comfortable saddle for general road riding. The steel parts are made much like Model B, though the saddle has quite a different appearance. Weight, 26 ounces. Model H, the semi-racer, is intended for road racing and light riding. The saddle, while not entirely rigid, possesses enough stiffness to make it adapted to road scorching, having every means of adjustment for tilting and taking up the slack. Weight, 20 ounces. Model I weighs 21 ounces, and has adjustment for taking up slack or for tilting purposes. It is finished in nickel, and has been brought out to meet competition in cheap saddles. It is stated that all solid comfort saddles are finished in extra heavy nickel plating, finely polished; also that the leather tops are of the best oak leather, highly finished in either russet or black, or can be made specially in other colors if so ordered. All steel parts are referred to as being made of the best material, and the post brackets, cantles, &c., as being drop forgings.

THE RALEIGH CYCLE COMPANY, 2081-2083 Seventh avenue, New York, are presenting models similar to those of last year's, retaining all the prominent features of the Raleigh. The weights of the machines have been reduced materially, and will scale as follows: A A, listing at \$160, weighs 19 pounds, and is fitted with wood rims; A, listing \$150, weighs 22 pounds, and is fitted with wood rims; G, listing \$140, weighs 29 pounds, and is also fitted with wood rims. Their new pattern ladies' machine weighs 32 pounds and is fitted with either wood or steel rims, listing \$140. The new Model, C, weighs 34 pounds, listing \$125, is always fitted with steel rims.

The Unpopular Merchant.

IT IS DIFFICULT to see ourselves as others see us, writes a traveling man with a wide acquaintance. There is a man in the dry goods business in, well, say Tokio, who made himself tremendously unpopular with the boys on the road. To get even with him one of them "wrote him up" for a trade journal, but indulged very largely in sarcasm, well knowing that the boys would "catch on" at once. He was spoken of as being "the most affable man on the road;" "the drummers' pet," and many such phrases. When the article appeared the dry goods man accepted it as a tribute to his worth, and sent in an order for extra copies of the paper to be mailed to his friends. That was where "sarkasm" was lost on him.

New England Iron and Hardware Association.

A MEETING of the New England Iron and Hardware Association was held at the United States Hotel, Boston, January 9. After the dinner an address was made by the president of the association, S. A. Bigelow, of Bigelow & Dowse. Mr. Bigelow's remarks were forcible and full of thought and were greatly enjoyed by the company. The principal address was, however, made by Horace P. Tobey, president of the Tremont Nail Company, Wareham, Mass. It related to the tariff question and was a careful discussion of the effect of the proposed changes. Toward the close of the meeting, after much discussion, which developed a wide diversity of opinion, the following resolution was adopted:

Resolved, That the New England Iron and Hardware Association respectfully represents to the Committee on Ways and Means of the United States House of Representatives that the continuance of the duty upon imported crude Iron, to wit, Pig Iron, Scrap Iron and Scrap Steel, is an injustice to the dwellers upon the coasts of the United States, and that this association protests against it.

Bruce & Cook.

BRUCE & COOK, 186 to 190 Water street, New York, have issued their calendar for the present year, in which attention is prominently called to the fact that the house was established in 1812, and accordingly is now in its eighty-second year. In connection with the calendar they issue a circular referring to the business of the past year and alluding to the outlook for 1894 in the following terms, referring especially to the desirability of prompt action in regard to the tariff:

The question of tariff revision which is now before the country, will, no doubt, keep matters in a more or less unsettled condition until it is finally passed, and the country adjusts itself to the new conditions under which business may be done. Meanwhile, uncertainty as to the exact changes to be made and the date upon which they shall take effect will hamper all lines of industry which are affected. It seems to us that the sooner the matter is acted upon and settled definitely the better it will be for the prosperity and well being of the country. For several months there has been a large decrease in the production of all lines of goods, especially those connected with metals, and while there is no question that consumption has also decreased, and that there are a large number of men out of employment, we see no reason why a return to former prosperity may not be looked for early in the coming season, especially if before that time tariff matters are finally adjusted. Without exception, all goods in the metal line are at exceedingly low prices, and any return to the usual output of manufactured goods, must give an increased impetus to labor and manufacturing, which will equal, if it does not exceed, that of former years.

It is a source of gratification to be able to say that nearly all branches of the metal and kindred trades have shown remarkable strength during the last few months, and we think a

smaller percentage of resulting failures have occurred than in almost any other distinct line that can be named. We believe this is owing largely to the method of doing business, which is mostly for spot cash or on very short time.

Sale of the Branford Lock Works.

HENRY R. TOWNE, receiver of the Branford Lock Works, has been directed by the court to offer the property at private sale as a going concern. Pending this the receiver is continuing the business as usual, so that if sold it may be transferred without the injury which would result from a temporary stoppage of the business. Mr. Towne has acted during the past year as president of the works by the request of the stockholders, and has, we are advised, brought the business up to a point where under normal conditions it can be operated at least without loss, whereas for several years past it has been conducted at a heavy loss. Its continuance, however, necessitated new capital to make good the losses of previous years. Mr. Towne placed these facts before the stockholders and urged them to provide the new capital needed. The stockholders appointed a committee of investigation, who have made an exhaustive examination of the company's affairs, confirming Mr. Towne's previous statement and complimenting him on the results of his management. The stockholders, however, were unable or unwilling to advance new capital, and decided therefore to apply for a receivership. By a unanimous vote they requested the appointment of Mr. Towne as receiver, which was done. The receiver now advertises the property for sale, and is ready to furnish any information about it which may be desired, and to afford every facility for its inspection.

The Man Who Knows.

IN EVERY store there is generally some one man who is constantly referred to about stock, prices, ways of shipping, &c. Sometimes he is a member of the firm, but oftener he is one of the employees. Every detail of the business seems to be at his finger ends. He is rarely the brilliant man of the house; on the contrary, he is the one who is at work at the desk or shelves when the others are joking about the stove in winter or at the door in summer.

He rarely takes any credit to himself because of the availability of his information and of his varied knowledge. He is apt to be unassuming and to look upon the ready-tongued salesman as one who is greatly his superior. But when changes are made in the house he is the last one the firm will allow to leave them, and he is given an interest in the business because there is no one to take his place if he should choose to go away.

Traveling men meet such a man as this in every city and in almost every store. Everything about his business is of interest to him. He is not obtrusive, but he manages to hear what is said about goods and prices, and as he has opportunity he has questions of his own to ask about articles or points not fully understood.

His talents are simply an all engrossing interest in his business, so that the

least detail is of importance to him. This, combined with a memory that he has cultivated, enables him to easily keep posted in prices and changes, and in working about the shelves he almost unconsciously takes note of the stock, so that he is ready to tell its condition, if called upon for information.

No clerk having regard for his future ought to do less than this, but the fact that so few meet the full requirements of their position is the reason that the one who answers all expectations is so sure of appreciation and advancement.

Manufacturers of Canada.

A COPY of a Canadian work entitled "The Shipping Manufacturers' List," a guide to the manufacturers of Canada and their products, by M. J. Henry, Toronto, has been received. The work contains 560 pages, and is designed to be of service to merchants and manufacturers of Canada who are buyers of Canadian goods. A supplement of 48 pages containing the names, business and post office address of all manufacturers in the work is printed in pamphlet form, alphabetically arranged, for use of those in the United States and others who wish to address Canadian manufacturers.

Trade Items.

THE WHITE MFG. COMPANY of Minneapolis, Minn., have opened a branch office and storeroom at 212 Washington street, Chicago, under the management of H. E. Landry, for the sale of the W. & L. Wire Mats.

CHAS. K. BARNES & Co. of 224 South Fourth street, Philadelphia, have presented their numerous friends with a handsome pocket memorandum book and card case, which will certainly be appreciated by all fortunate enough to receive one. It is handsomely and strongly bound in a good quality of Russia leather, the front cover bearing the single word "Catasauqua" in gilt letters. The inside fly leaves contain the firm's business card and a list of "Catasauqua" productions, also calendars for 1894 and 1895.

OWING to the decease of the senior member, the Hardware business of the Isaac Diller & Sons Company, Lancaster, Pa., will hereafter be continued by Mr. Diller's sons under the style of Isaac Diller's Sons.

CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio, whose calendar for 1894 we noticed in our issue, 4th inst., advise us that on a single day they received 36 inquiries for the calendar from the trade, in nearly every one of which the writers referred to the mention which the calendar received in our columns. The company state that they still have a few of the calendars left, which they will be glad to send on application.

D. H. CASSEL, Crestline, Ohio, is distributing, with his compliments, a calendar with large date figures. Attention is directed to his line of Hardware and Stoves, and also to the fact that he manufactures Tin, Copper and Sheet Iron Ware.

OUR PHILADELPHIA REPRESENTATIVE informs us that the Saw, File and Tool Works of Henry Disston & Sons are beginning to run on fuller time than they have been able to do within the past six months. Samuel Disston says there is nothing very inspiring in the outlook, but they are inclined to look for gradual improvement, and possibly some degree of activity, when the tariff question is settled, but there cannot be anything important until then. Meanwhile there is some improve-

ment and the works are running about four days a week. The foreign trade keeps up fairly, and among recent orders was one for a lot of 72-inch Circulars for India to use on Teak, the toughest and most difficult of all woods to work. Sheffield Saws are out of the race on this kind of work. They have also an order from Pittsburgh for 86-inch Circulars 1 inch thick, to be used in sawing armor plates at the Carnegie works. These Circulars will saw the toughest armor plates that can be made.

THE DESIRABILITY of Hardware merchants handling Bicycles is alluded to in the effective advertisement of the Monarch Cycle Company, Chicago, which appears in this issue. They make the point that the sale of a car-load of Nails will not afford the profit which can be realized from the sale of a Monarch Bicycle, and at the same time refer to some of the special features of their machines.

FRANK LAWTON, who has for a long time been identified with the File trade and has a wide acquaintance among merchants, is now representing the Nicholson File Company, Providence, R. I.

THE STRONG & TROWBRIDGE COMPANY have been incorporated with a view to taking over and conducting the business heretofore carried on under the style of Strong & Trowbridge, at 22 and 23 State street, New York. The company take all the assets and assume all the liabilities of the old firm, and all of their stockholders and officers were connected with the old business. The officers are as follows: J. J. Phelps, president; G. F. Trowbridge, vice-president and general manager, and W. A. Green, secretary and treasurer.

BUHL, SONS & Co., Detroit, Mich., have donated eight dozen Mattocks of the best quality to the Park and Boulevard Commissioners of that city for the use of laborers procured from the poor commission, most of the unfortunates having no tools or implements of any description. Fletcher, Jenks & Co., also of Detroit, have donated eight dozen long handled Steel Shovels of the best quality for the same laudable purpose.

A. W. BOSWORTH, JR., sold his interest in the Hardware business of M. Y. Cliff & Co. of Glenwood, Wis., on January 2, to W. G. Mosher. The firm style will not be changed.

REFERENCE was made in our last issue to the fact that North Brothers Mfg. Company, Philadelphia, had improved the Shepard Lightning Freezers, which are now made by them, by the use of electric welded wire hoops. We desire to add that the improved hoop is now being used on all freezers made by them and is considered by the manufacturers as an important feature.

NATIONAL SPECIALTY MFG. COMPANY, Lehigh avenue and Third street, Philadelphia, have engaged as their direct representative C. M. Avery, long and favorably known to the jobbing trade. In addition to the National Measuring Faucet, National Tobacco Cutter and National Coffee, Drug and Spice Mill, No. 1, the company will soon put on the market Nail Pullers, a line of grocers' sizes of Coffee Mills, Grocers' Hardware and other specialties. The company state that they are in good shape to make prompt shipments of such of their goods as are ready for the market.

HENRY MOORE, late of Woolley, Baynon & Moore Company, is now located at 106 Chambers street, New York. Mr. Moore advises us that he

has made arrangements with several well-known manufacturers and importers to sell direct for them or job their goods.

Price-Lists, Circulars, &c.

E. C. STEARNS & Co., Syracuse, N. Y.: Illustrative and descriptive catalogue of Hardware. This contains 80 pages, showing with list prices Door Hangers, Sliding Barn Door Locks and Catch combined, Window Screen Frames, Spring Hinges, Screen Door Check, Lawn Mowers, Jack Screws, Hammock Hooks, Thimbles and Registers, Casters, Floor Pulley Hook, Hay Fork Pulleys, Clothes Reel, Breast Strap Slides, Sink Legs and Brackets, Slop Hoppers, Sinks, Faucets, Vises, Mallets, Handles, Bench Drill, Bench Hook, Quilt Frame Clamp, Screw Clamps, Shaves, Pointers, Adjustable Hollow Auger, Expansive Hollow Auger, Taper Auger, Caster Bit, Tongs, Twist Drills, Stable Fixtures, &c.

T. G. ELLSWORTH, general manufacturers' sales agent, 85 Chambers street, New York: Ice Tools. An illustrated sheet calls attention to Stoppard's Patent Ice Tongs and the Mogul Ice Scale.

HARKINS & WILLIS, Ann Arbor, Mich.: Jim's Toaster. The manufacturers state that it toasts evenly and quickly, without smoke or smell, and that from one to four slices of bread can be toasted in two minutes over one flame. The toaster is adapted to use on gasoline or gas stoves.

O. LINDEMANN & Co., 81 Beekman street, New York: Bird Cages. Their 1894-'95 catalogue illustrates an extended line of Japanned, Brass and Tinned Wire Bird Cages and Cage Sundries. A medal and diploma were given the company for their display at the World's Fair.

W. W. LAWRENCE & Co., Pittsburgh, Pa.: White Lead, Paints and Varnishes, Linseed Oil, Brushes and Painters' Supplies. An 1894 catalogue is devoted to these goods, in which special attention is directed to Whiting's Brushes, Lawrence White Lead, Lawrence Turpentine Liquid Dryer, &c.

THE CLARK MFG. COMPANY, Buffalo, N. Y.: Hardware specialties. Their 1894 catalogue of 43 pages illustrates with list prices and descriptions Blind and Shutter Hinges in a variety of styles, Gate Hinges and Latches, surface and mortise Gate Latches, Loose Pin Door Butts, Frame and Axle Pulleys, &c. Special attention is directed to Diamond and Cottage No. 1 Blind Hinges, Empire Reversible No. 25 Blind Hinge, Dixie L. & P. and Buffalo Reversible Shutter Hinges, No. 25 Buffalo, No. 35 Champion and No. 85 Drive Sash Pulleys.

MANN EDGE TOOL COMPANY, Lewistown, Pa.: "Some words about Axes in General and Mann's Special Axes in particular." The pamphlet treats of Axes under the following headings: The Axe of To-day, America and Axes, Quality of Steel, The Form of the Steel, The Poll of the Axe, Processes of Manufacture, Factory and Facilities, Mann's Special Axes, Other Tools, Styles of Finish, Greeting, Ourselves and the Trust. Among other interesting facts it is stated that the annual American production of Axes aggregates about 300,000 dozen, and that about 200,000 dozen of these are consumed in this country and the surplus is exported.

BLAIR HUSKING GLOVE COMPANY, Bucyrus, Ohio: Blairs' Husking Pins, Gloves, &c. An illustrated catalogue shows these goods in a variety of forms.

The manufacturers remark that they are now strictly in the Husking Glove and Pin business, and propose to turn out the best goods for the money in the market.

VICTOR MFG. COMPANY, Newburyport, Mass.: Victor Cement. The company send with their compliments an illustrated postal card, emphasizing the desirability of their goods.

REED & PRINCE, Worcester, Mass.: Illustrated catalogue and price-list of Rivets, Bolts, &c. The listed goods include Black and Tinned Iron Rivets, Oval Head Rivets; Norway Iron, Block and Carriage Rivets, Iron Burrs, Tinned and Coppered Iron Belt Rivets and Burrs; Tinned Countersunk, Tinned Knob, Barrel and Coopers' Rivets; Shovel and Shovel Strap Rivets; Wheel Head and Section Rivets; Trunk and Hame Rivets; Sink Bolts, Tapped Nuts, Stove Bolts, Stove Rods, Range and Furnace Rods, Iron Machine Screws, Brass Machine Screws, Iron and Brass Wood Screws, &c.

JOSEPH H. SEED, 21-23 Centre street, New York: Seed's specialties. A circular illustrates Self-cleaning Water Filters, Water Strainer, Coat, Hat and Bag Hanger, Tea and Coffee Strainers, Gas Stove Stand and Drop Light combined, Gas Tip Cleaner, Alcohol Pocket Cook Stove, Family Soldering Set, Paper Bag Holder, Garden Hose Fastener, Anti-electric Automatic Alarm Bell, Towel Holder, Self-lighting Gas Burner and Gas Boiling and Cooking Stoves.

WM. C. LEAVITT, Norway, Maine: Leavitt's Improved Boiler Handle. The Handle is illustrated showing its construction and position on the boiler, and is referred to by the manufacturer as neither cutting nor burning the hand.

It Is Reported—

That the Hardware store of A. J. Stewart & Co., Sullivan, Ind., was burglarized on the 4th inst.

That T. T. Smith has sold out his Hardware store at Nebo, Ill., to Alves Hayes.

That Charles Meddaugh has recently entered the Hardware business at Garner, Iowa.

That H. B. Sultelgte has purchased the Hardware stock of H. H. Parrish, Archer, Iowa.

That the style of the Implement firm of R. W. Coates & Co., Bloomington, Ill., will on March 1 be changed to M. A. Coates & Co. The firm have been in business about 15 years. R. W. Coates will retire in order to give his whole attention to other affairs.

That the Hardware firm of Evans & Kelly, Savannah, N. Y., has been dissolved by mutual consent, R. H. Kelly retiring. The business will be continued by A. W. Evans. Mr. Kelly will remove to Walcott and engage in the Hardware business with his father at that point.

That Tulley & Davis, Lowville, N. Y., have dissolved partnership. Edgar A. Davis will continue the Hardware business and James H. Tulley the tin-shop.

That J. W. Goodhue's Hardware store at Ipswich, Mass., was burned out in a large fire at that place on the 13th inst.

That S. A. Peck has sold his stove and tin store at Greenfield, Mass., to Williams & Knight.

That on the 12th inst. the Hardware establishment of C. Dreisbach's Sons, Lewisburg, Pa., was damaged by fire the extent of \$3500.

That Joseph L. Eicher has sold out his stock of Hardware at Quincy, Ohio, and will enter some other business.

That the Hardware store of Edwards & Grant, Melrose, Ohio, was robbed on the 4th inst.

That the Hardware business of J. T. Emmons, Greenfield, Iowa, is now being carried on by W. F. Brandon.

That Edmund H. Coombs, son of the late J. Marsh Coombs, will, about February 1, embark in the wholesale heavy Hardware business at Fort Wayne, Ind. Harry Shirk, Frank Woods and Nelson Thompson, of the old firm of Coombs & Co., will be associated with Mr. Coombs.

That Hinds & Hedges, Lyons, Kan., have sold out their Hardware and Implement business.

That the Hardware stock of R. M. Essick, Sabula, Iowa, has been purchased by a new firm, the style of which is Schroeder & Butzlof.

That Marple & Wharton, Hardware merchants, Yates Center, Kan., have disposed of their business to Rankin Bros.

That Hoffman Bros.' Sedalia, Mo., have disposed of their Hardware stock to J. M. Offield, who will hereafter conduct the business. The consideration was about \$12,000.

That Tilly Bros., Hardware store at Brazil, Ind., was entered by burglars on the 2d inst.

That the Scott Hardware Company, Freeport, Ill., have certified to a dissolution and surrender of charter.

That Mackey & Maley have recently entered the Hardware business at Rhodes, Iowa.

That burglars entered the Hardware store of Switzer Bros., Defiance, Ohio, on the 1st inst., and carried away a lot of Revolvers, Knives and Razors.

That George E. Reiner, Girard, Kan., has very much enlarged his facilities for the prosecution of his Hardware and Implement business.

That the Hardware business of Sneed & Johnson, Streator, Ill., has been purchased by W. A. Johnson.

That John Harper of Terral, Ind. Ter., has decided to open a Hardware and Implement house at Ryan.

That the Hardware firm of Erickson & Hellekson, Wheaton, Minn., have been succeeded by Erickson, Hellekson & Co., Edward Boley having become a member of the firm.

That the Hardware store of Hewitt Dent, Rockford, Ill., was robbed recently.

That the Oxford, Miss., Hardware stores of W. J. Jenkins and Lewis & McKey were burglarized on the 7th inst.

That J. G. Burt's Hardware store, San Bernardino, Cal., has been reopened.

That M. Scheid & Son have purchased the Hardware stock of J. B. Frazier, Fairmont, Minn.

That the Hardware store of Reinhardt & Osborne, Louisville, Ky., was damaged by fire on the 9th inst. The loss is estimated at \$1500, which is fully covered by insurance.

That at the recent annual meeting of the Hulse Hardware Company, Rockford, Ill., Guy P. Cobb was elected president, J. S. Hulse secretary and general manager, and John S. Huffman treasurer.

That John Sauer, Jr., is about to engage in the Hardware business at Le

Mars, Iowa. Mr. Sauer was formerly in the lumber business at Merrill.

That A. M. Songer has sold his Hardware store at Alvan, Ill., to John Holland.

That fire broke out in the Hardware store of Quincy Dyer, Hyde Park, Mass., on the 9th inst. Before it was extinguished it damaged the building \$800 and the stock to the extent of \$6000. The latter was insured for \$5000, the building being fully insured.

That William Dean has engaged with W. E. Bunney in the Hardware business at Belleflower, Ill.

That Charles B. Smith has bought the interest of A. W. Wilkerson in the Hardware firm of Peyton & Co., Belton, Texas.

That the Hardware stores of L. C. Parmenter and C. F. Paige, Athol, Mass., will close Tuesday, Wednesday and Thursday evenings at 6 o'clock until April 1.

That the Hardware store of Shawhan & Boonshot, Petersburg, Ind., was burglarized on the night of the 3d inst. An entrance was effected by prying open the front doors. A half dozen Razors were secured by the thieves. It is conjectured that the thieves were after money, as the firm's stock of Pocket Cutlery and Silverware was not molested. In prying open the doors the lock was completely demolished and the doors split.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—There are some signs of impending commotion in the market for this pigment. The corrodors controlled by the National Lead Company profess to maintain the list price recently adopted, which places the rate for 12 tons or over in kegs at 5¼¢, less 2½ per cent. for cash, but information from other sources goes to show that special rates are being made in quarters where competition is keenest. In the West the quotation of 5¢ less 2½ per cent. is made by independent corrodors for 500 pound lots, while ½¢ @ ¼¢ less is said to be named on larger quantities. Corresponding figures have also been quoted in New York and other Eastern markets. The manufacturers of quick-process Lead are also on the alert and offer dry Lead at as low as 4½¢ in carload lots. Manufacturers of mixed Leads are pushing their goods in the usual vigorous manner and making all sorts of prices. For the present the market is in a very uncertain position. Not only the circumstances above alluded to but the low cost and plentiful supply of raw material operates against any turn for the better in the immediate future.

Red Lead.—Some fairly large sized contracts for the cheaper varieties have been placed by contractors. The prices were understood to have been 5¼¢ @ 5½¢, less a discount. German has also met with somewhat better sale, but the high grade American product is as yet rather slow.

Litharge.—None but merely routine deals have been put through, and the market at this time is devoid of other feature than that prices are somewhat unsettled. The high are noticeably slow. In fact, the only exhibition of life has been in the sorts taken by a few large consumers and which sell at prices between 4½¢ and 5¢. On the qualities used in the Paint trade, 5½¢

@ 5¼¢ are strictly bottom prices, and up to 6½¢ is asked for small parcel.

Orange Mineral.—There is nothing more than routine business passing in foreign brands and the sales of domestic are on a very moderate scale. Such as it is, the business passing is quite in line with the general run previously this month.

Zincs.—The market for American Oxide is soft. Sales agents quote the old figures and state that business is all that could be expected in point of volume. The roseate outlook is subject to modification, however, since some producers are not securing all the orders they can handle, while crude material is not only plentiful but remarkably cheap. Foreign brands are quoted at old prices, but quotations and actual selling basis are somewhat apart.

Colors, &c.—Some increase is noted in the sales of various lines of the more staple Dry Colors, but the dealings are chiefly of routine type and have not sufficient force to counteract the natural effect of sharp competition. Hence values continue irregular and low nearly all along the line. Ready Mixed Paints and Metallic Paints have met with somewhat better sale, chiefly at revised prices that went into effect on the 2d inst.

Oils and Turpentine.

Linseed Oil.—No change of importance in this line has taken place. Some few lots of out-of-town brands have been sold, or at least offered, at 46¢ delivered here and there were faint signs that some of the outside crushers are becoming restive. Otherwise the prices that have ruled for a fortnight past remain in force, that is to say, 47¢ for Raw and 50¢ for Boiled Oil. The demand is rather slow, however, and hardly up to the average volume for the second half of January.

Cotton Seed Oils.—Large Western consumers have purchased considerable quantities of Crude Oil for shipment in tank cars direct from the producing points to their works. This movement has sufficed to stiffen the Southern market to the extent of nearly or quite 2¢ per gallon and incidentally bringing about a stronger tone in the New York market. Dealings here have been on a rather moderate scale, however, and jobbers and exporters are extremely indifferent, since they have been in receipt of none but very commonplace orders. Prime Crude sold here at from 29¢ up to 31¢. Prime Summer Yellow went at 34½¢ @ 35¢, choice ditto at 37¢, but the general asking prices are now 36¢ @ 37¢ for prime and corresponding rates for other varieties.

Lard Oil.—Some improvement to tone of the market has accrued from the support or influence of higher average prices for raw material. Otherwise there is no change. In any event the orders received were filled at the prices that ruled last week, and the orders were not unusually numerous.

Fish Oils, &c.—There has been hardly any business in crude Sperm Whale or Menhaden, and the nominal prices remain unchanged, since holders manifest no anxiety to realize. In the pressed and bleached Oils there is a fair jobbing business at about former prices. There is no change in Cod Oils. Olive and Palm Oils are held somewhat more firmly, but as yet have realized no actual advance.

Spirits Turpentine.—The market has shown somewhat irregular tone and is rather unsettled at the present time, owing to more or less sharp reaction from the extreme prices in the South that were recently established. Purchases can be made now at 30½¢ for regular and 31¢ for machine barrels, on the spot, and at ½¢ less to arrive.

Tack Hammers.

Troy Nickel Works, Troy, N. Y., are putting the tack hammers illustrated in Figs. 1 and 2 upon the market. The

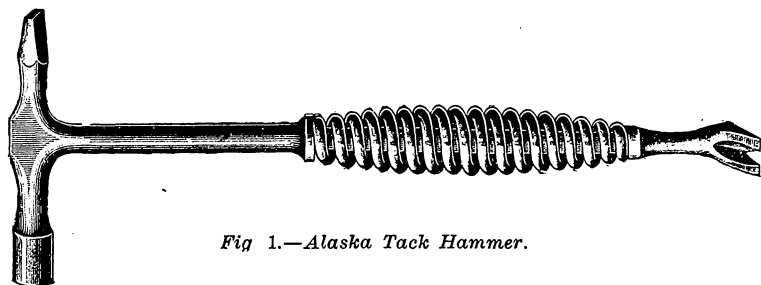


Fig. 1.—Alaska Tack Hammer.

Alaska hammer, shown in Fig. 1, is made of solid steel, full nickel plated. Fig. 2 represents the Perfect ladies'

pressure of the forefinger when in action. The seven shots can be fired with remarkable rapidity, and standard cartridges are used. The weapon is constructed in the most substantial

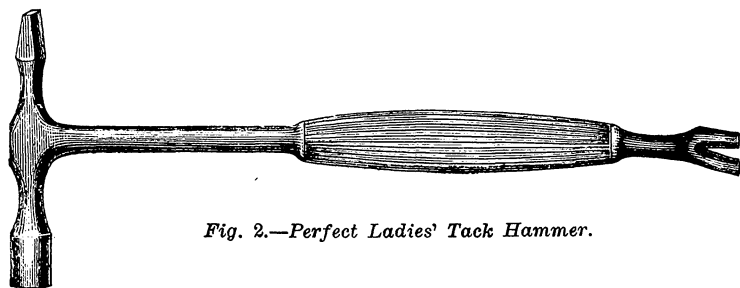


Fig. 2.—Perfect Ladies' Tack Hammer.

hammer, made of solid steel, full nickel plated, with a fluted rubber handle. It is stated that these goods are made in

manner, all of the wearing parts being of the best forged steel. In use it is grasped in the palm of the hand, with

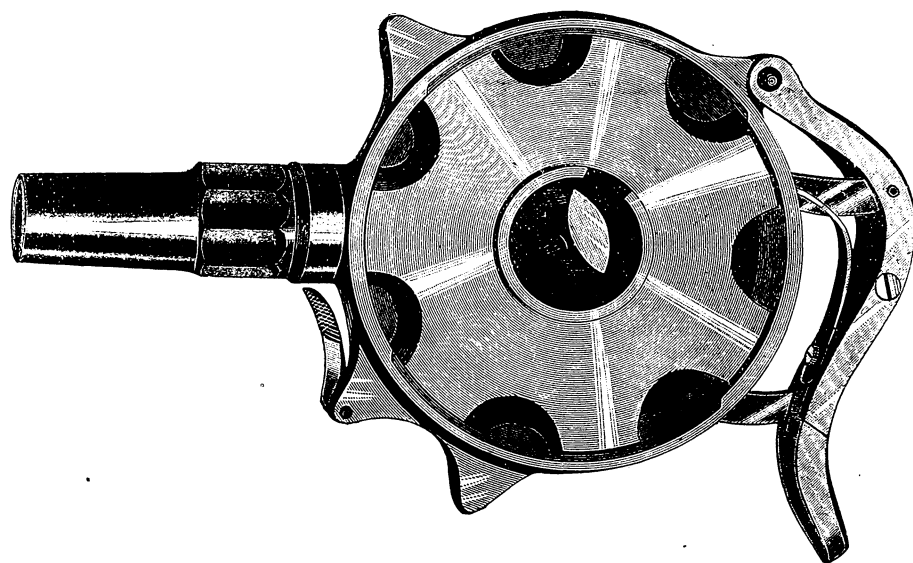
the muzzle projecting between the index and second fingers. It can thus be carried ready for action without at-

Rubber Ice Creeper.

Herman Mayer of Bradford, Pa., is the inventor of an improved ice creeper, which is made of nothing but pure rubber, and which, it is claimed, will last the wearer for several seasons. It is stated that it is so ingeniously constructed that a lady or gentleman can wear it with perfect ease, and that no matter how slippery the walks may be the creeper will prevent the wearer from slipping, besides giving strength to the ankle and elasticity to the step. It can be worn with or without overshoes. Mr. Mayer advises us that he will be prepared to put the creeper on the market in the course of three or four weeks.

Jewel Can Opener.

The cut herewith shown represents a can opener being offered by the Jewel Tool Company, 76 and 78 Park place, New York. The opener is provided with a wooden knob shaped handle which is pivoted to revolve, allowing it to be held tightly in the hand while inscribing the circle in opening the can. The cutting is done with a circular revolving wheel, indicated in the cut by a dotted line, which is attached to the thumb screw, having an adjustment for cutting circles from $1\frac{1}{2}$ to 4 inches in diameter. The half circle wings rest upon the top of the can, and keep the opener level and the wheel in cutting position while the opener is being revolved. In operation the point is stuck through the center of the can cover and the opener is revolved in the same manner as the handle of a coffee mill. The point is made that if the strength in the operator's hand is not sufficient to cause the cover to be cut entirely through in one revolution of the opener, additional revolutions will accomplish the desired results. The cover of the can may be cut entirely out, or enough of it may be left as a hinge to admit of its being bent back. The manufacturers



The Protector Revolver.

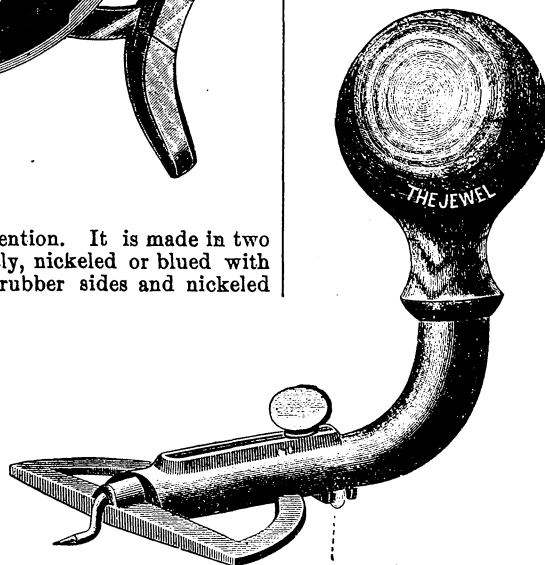
the best and most durable manner, and are designed to retail at from 20 to 25 cents each. The company are about making these goods finished in tin plate also.

The Protector Revolver.

The Chicago Fire Arms Company, rooms 437-438 Monodnock Building, Chicago, have made improvements in the Protector revolver, a descriptive illustration of which was given in *The Iron Age*, May 26, 1892. The accompanying sectional cut shows the magazine and hammer of the improved revolver at full cock. The cylinder revolves toward the barrel, instead of from left to right, so that the revolver can be carried in the vest pocket as easily as a watch. It occupies less than one-half the space of the ordinary revolver in the pocket and weighs but 11 ounces. A safety spring is attached, which is controlled by the

tracting attention. It is made in two styles, namely, nicked or blued with vulcanized rubber sides and nicked

or blued with pearl sides, handsomely finished and polished. The present manufacturers have just entered the market and will be ready to make deliveries on February 1, 1894.



Jewel Can Opener.

claim that the opener cuts clean, leaving no rough edges, without disturbing the contents of the can, without danger of injury to the hands, and that the cutting wheel will not get dull.

The New Perfection Cutter.

North Brothers Mfg. Company, Philadelphia, Pa., for whom John H. Graham & Co., 113 Chambers street, New York, are agents, are offering the cutter herewith illustrated as an improvement on the Perfection cutter

in attaching the crank. The crank and the shaft have corresponding flat surfaces, so that to take the cutter apart the thumb screw at the end of the shaft is given a half turn, the catch pushed to one side, when the crank can be taken off and all parts taken from the cutter. It is pointed out that in the construction special care has been taken

divided, and that all unnecessary friction and waste of power is a voided. Any wear that may take place in the course of time in the cone or cutting screw is always taken up in putting the cone in the machine, and such wear, it is stated, instead of dulling the cutting edges, sharpens them. The cone furnished regularly with the machine has holes $\frac{5}{8}$ inch in diameter. Cones with holes $\frac{1}{2}$, $\frac{3}{8}$, $\frac{5}{16}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$ or $\frac{3}{8}$ inch in diameter will be furnished when desired. It is stated that the machine will cut cooked meats of all kinds, chicken, lobsters, oysters, hash, suet, codfish, material for mince pies and fruit cakes, almonds, cocoanuts, stale bread, crackers, vegetables, raw meats, &c. The manufacturers state that in the new machine all the objectionable features in Nos. 1, 2 and 3 machines have been overcome. The present cutter is made in two sizes: No. 101, to cut 1 pound per minute, and No. 102, to cut 2 pounds per minute.

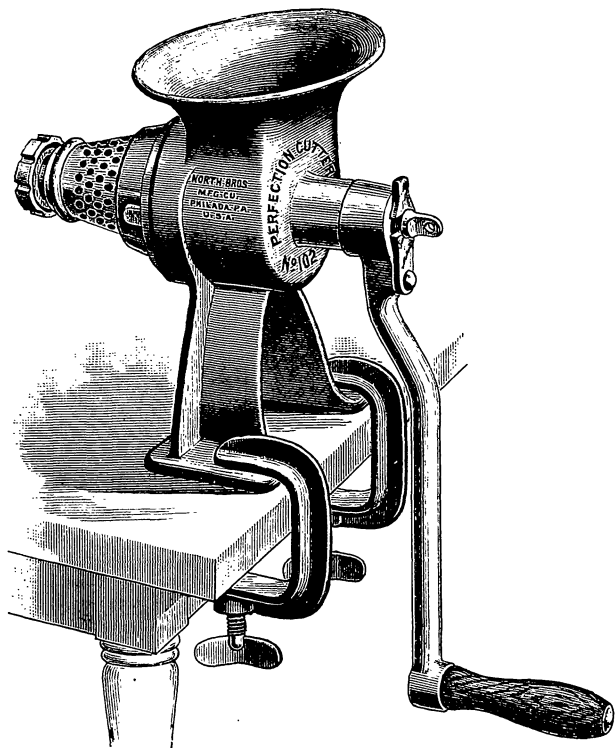


Fig. 1.—The New Perfection Cutter.

Nos. 1, 2 and 3. As improved the adjustment of the cone and the cutting screw is made by a nut and washer at the end of the cutting screw. As shown in Fig. 2, the cone is placed on the cutting screw, followed by a washer and nut, and the nut is screwed up tight, thus bringing the parts in close contact and ready for cutting. The

to arrange every part of the machine so it can be easily reached with the fingers for cleaning. The machine is held in place on the table, either temporarily by two clamps furnished with each machine or permanently by screws, for which holes are drilled in the base, thus enabling the same cutter to be fastened either way. In use the meat, &c., to be cut is dropped in either large or small pieces, as desired. The pieces are forced forward by the screw to the cone, where

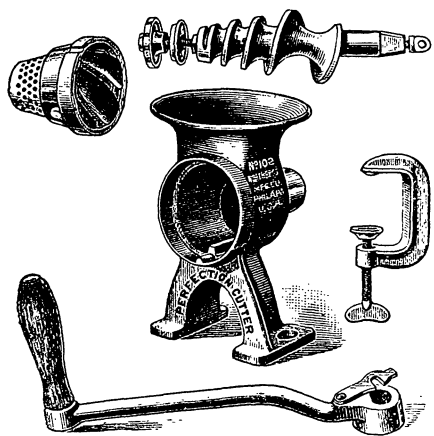


Fig. 2.—Parts of Perfection Cutter.

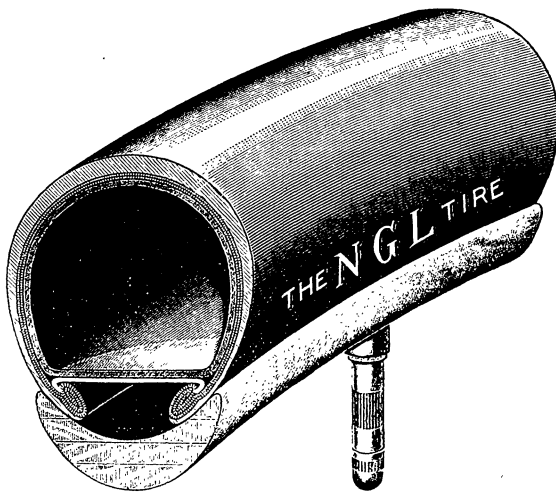
adjustment is entirely confined to the cone and the cutting screw. It is explained that the frame becomes simply a convenience for holding the parts, so that the screw can be turned by the crank and the meat, &c., conducted into the parts to be cut. The hopper on the frame has been enlarged and the cutting parts raised higher from the table to allow more room for dishes, &c., to be placed under the machine. Another improvement has been made

they are cut between the sharp edges of the revolving screw and those of the stationary oblique knives in the cone, and finally to a uniform size by a further cutting in passing through the holes in the cone. It is stated that the work of cutting is thus advantageously

requires no opening in the rim. The manufacturers remark that in the design and construction of the tire economy has not been taken into account in the slightest degree, and that the best material and skilled labor are employed in its manufacture.

The N. G. L. Tire.

The accompanying illustration shows the Never Get Left tire, put on the market by the Boston Woven Hose & Rubber Company, 275 Devonshire street, Boston. The manufacturers state that the air tube is made up endless, with valve nipple complete before vulcanization, that there are no joints made up with rubber solution, and that there is not a particle of rubber solution in the construction of the tire; also that the fabric used in the covers is the best selected long fiber Sea Island cotton. The clamping band has turned edges, the edges engaging the bead of the tire a short distance below the edge of the rim, where there is no movement, and consequently, it is stated, no friction or wear, thus relieving in the greatest possible degree the thin portion of the tire at the edge of the rim, and at the same time bringing the face of the band above the edge of the rim, to prevent the impinging of the tire by the rim when a stone or other object is struck. The tire is quickly applied to any plain rim that has sufficient depth, either steel, wood or aluminum. The device for tightening and locking the band is adjustable to accommodate irregularities in the rims, is simple and



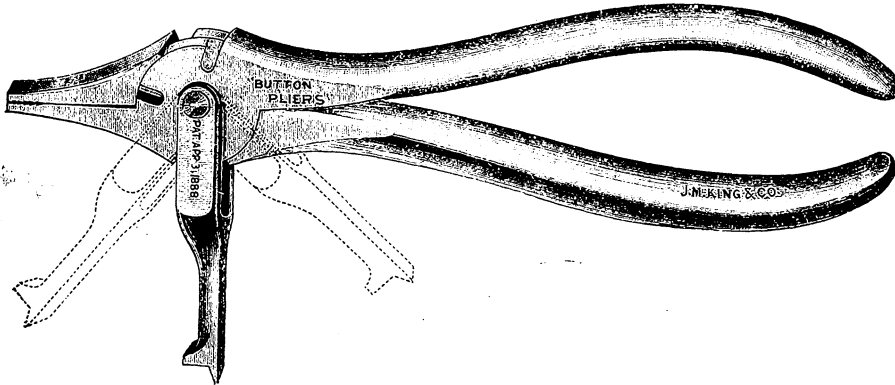
The N. G. L. Tire.

Button Combined Plier and Stretcher.

J. M. King & Co., Waterford, N. Y., are offering a wire stretcher in combination with their Button plier, as herewith shown. The plier proper is their Button plier, the combination being

a gauge to be used to register the pressure of the tire. After inflating the tire the hinged door is closed, and lies close to the rim concealing the inlet pipe and choker. The outer case has been improved, and as the result of experiments it is stated that the company are enabled to present a buoyant, strong and durable tire. The inner

full sized cut of the lock, which with a substantial safety chain weighs about 2 ounces. The lock is keyless and is operated by turning the four pins on the top, which when set in the correct positions allow the shackle to be withdrawn, thus opening the lock. The shackle is a notched piece of flat steel, to which one end of the chain is attached, represented at the right hand end of the lock. Each lock is lettered and is accompanied by a diagram showing the position of the pins when the lock is unlocked. The pins at the base are oval on one side and flat on the other, enabling the owner to open the lock in the dark if necessary. The locks are nicely polished and nickel plated, and are claimed by the manufacturers to be light, strong and unpickable.



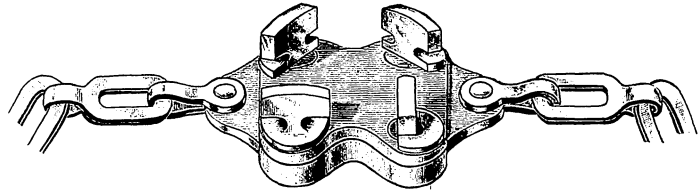
Button Combined Plier and Stretcher

made at present only in 10 inch pliers, but other sizes will be furnished if desired. It is stated that 10-inch pliers will cut anything not larger than No. 6 wire. Stretcher attachments, nickel plated, are put up one dozen in a box with rivets complete, and may readily be attached to the 10-inch plier.

Victor Pneumatic Tire.

The illustration herewith shown represents the tire of the Overman Wheel Company, Chicopee Falls, Mass., as improved in several important particulars for 1894. The cut shows the simplicity of the arrangements for inserting and withdrawing the inner tube. It is explained that there are no loose parts, that the inner tube is stiffened at the portion which covers the doorway, and that it will sustain a very high pressure; also that it is easily withdrawn when deflated. The choker attached to each tube retains the air pressure by com-

tubes are made under compression, to free them from imperfections which might cause leakage, while the joints at



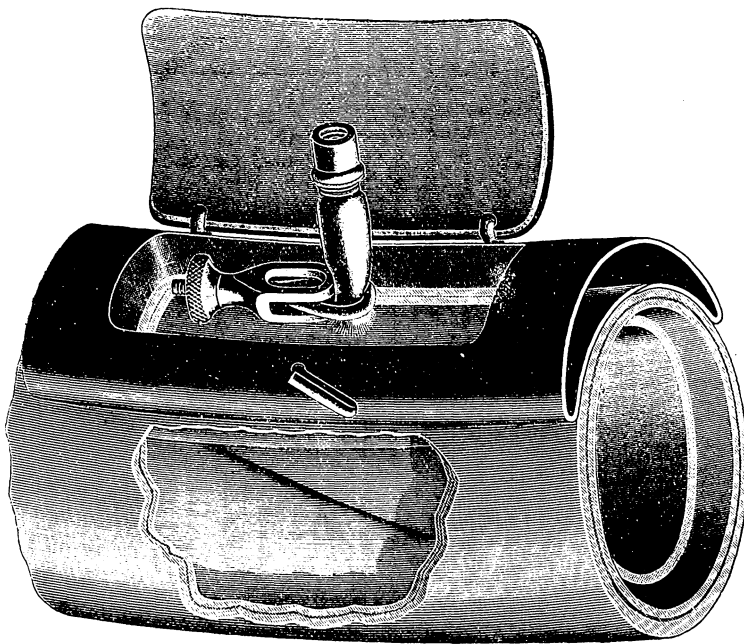
Goodhue Combination Bicycle Lock.

the ends are vulcanized under pressure. An extra inner tube is furnished with each machine.

Goodhue Combination Bicycle Lock.

The Independent Electric Company, Thirty-ninth street and Stewart avenue, Chicago, are introducing a bicycle lock as herewith shown, for which Howard

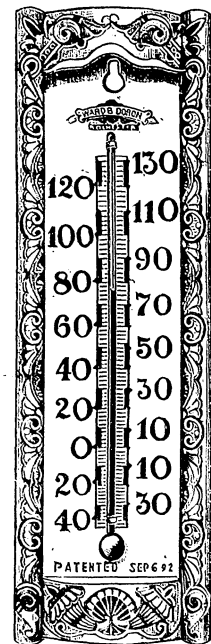
on opposite sides of the scale, and the tube is filled with red spirits, which is guaranteed to be non-fading. It is



Victor Pneumatic Tire.

pressing the stem or inlet pipe. The point is made that it never refuses to act through the presence of a little dirt, and that the unobstructed tube allows

A. Smith & Co., Newark, N. J., are sole agents for the States of New York, Pennsylvania and New Jersey, and for New England. The illustration is a



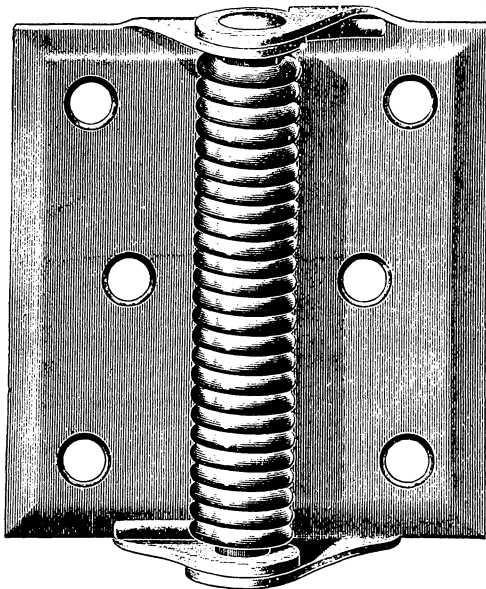
Distance Reading Thermometer.

stated that the thermometer can be easily read at a distance of from 10 to 15 feet.

The Armstrong Mfg. Company, Bridgeport, Conn., send a finely engraved calendar, showing some of their line of water, gas and steam fitters' tools. Appropriate date sheets are attached to the lower portion of the card.

Stearns' No. 45 Steel Spring Hinge.

E. C. Stearns & Co., Syracuse, N. Y., are putting on the market the non-hold-back spring hinge shown herewith. Each leaf is one solid piece formed up

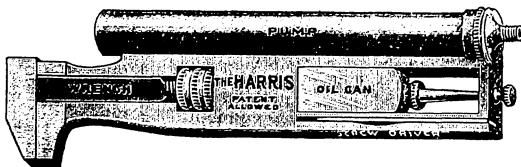


Stearns' No. 45 Steel Spring Hinge.

from annealed steel, the leaves being secured together by riveting over the heads of the pin which passes through the center of the spring, to prevent the spring from getting out of alignment. The spring is referred to as being of special tempered crucible steel wire, made for the purpose, possessing great strength, life and elasticity. The point is made that the lightness of weight consequent upon the steel construction of the hinge affords a material saving in transportation charges; also that the hinges may be used equally well upon right or left hand doors. They are packed one dozen pairs in a slide cover wooden box; one gross pairs in a case.

The Harris Combination Wrench.

The Harris Mfg. Company, 381 Main street, Buffalo, N. Y., are offering the combination wrench shown in the accompanying cut. It is made of drop



The Harris Combination Wrench.

forged steel, case hardened, seven inches in length and weighing ten ounces. The tool combines a wrench, oil can, pump and screw driver. The upper and lower sides of the oil can are each supplied with a small lug which run in grooves, allowing the can to slide back and forth. The grooves have openings near the end of the tool, so the can may be turned up or taken out for filling after the spout is unscrewed. The device is designed to obviate the rattling of tools, and also to do away with the necessity of a tool bag,

Pullman Malleable Garden Trowel.

Pullman Sash Balance Company, Rochester, N. Y., are introducing a trowel as shown herewith. It is made in one piece of malleable iron, thus



Pullman Malleable Garden Trowel.

nicely polished, unbreakable, self sharpening and self cleaving.

The Perfection Shoe Rest.

The Standard Mfg. Company, Dayton, Ohio, are marketing the shoe rest shown in the cuts herewith presented. The rest is made up of four pieces: the wall plate, bracket, box and the shoe. It is made of iron and hard wood, and is supplied with boxes for a brush,

casing, and that it will bear up 200 pounds weight. The point is made that ladies and children use it to button

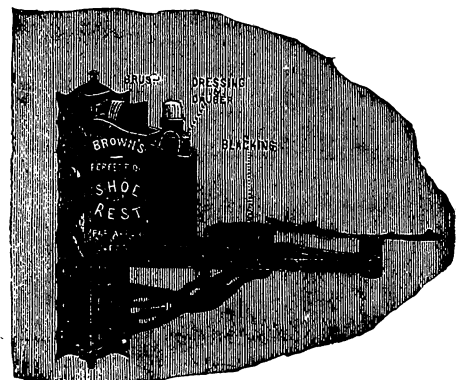


Fig. 1.—The Perfection Shoe Rest.

their shoes on. The rests are finished in two styles: japanned and nicked. The manufacturers claim these goods

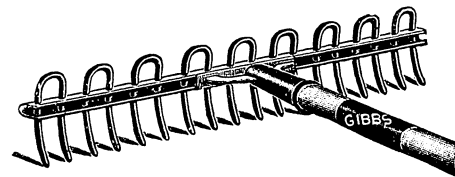


Fig. 2.—The Rest in Use.

to be finely made, ornamental in appearance and reasonable in price.

The Boss Garden Rake.

The cut here shown represents a garden rake being offered by Gibbs Mfg. Company, Canton, Ohio, for whom John H. Graham & Co., 113 Chambers street, New York, are agents. The rake head is of steel, specially formed for stiffness and strength, with teeth made of tough steel rods so as not to break, solidly held in place. The double teeth extending above the head are for breaking clods, which, the man-



The Boss Garden Rake.

ufacturers state, will pulverize the ground fine and quickly.

The handles are of selected ash, with the socket firmly secured to the head without rivets or weld. All the metal parts are brightly tinned to prevent rust or the goods becoming shop worn.

The manufacturers claim that the rake is light, well braced, strong in construction, durable, of excellent finish and low priced. The rakes are made in two sizes: No. 14, 12½-inch head, 14 pointed teeth, and No. 18, 15½ inch head, 18 pointed teeth.

New Champion Folding Steel Frame Barrow.

The Bryan Mfg. Company, Bryan, Ohio, are putting on the market a folding steel frame barrow, as shown in Fig. 1. Figs. 1, 2 and 3 illustrate the barrow in its different forms: Fig. 1, set up ready for use; Fig. 2, in the act

of being folded, and Fig. 3, as folded ready to ship or to store. It is stated that the space required to ship or store combinations of these goods. No. 4 is a size especially designed and constructed for mechanics' use and is also a useful

The Keystone Mfg Company, Buffalo, N. Y., manufacturers of Nonpareil ratchet wrenches, have recently added combination No. 4 to the former com-

bottom of the slits, and extending up between the quarters the necessary length to form a solid and sure support for the shank of the tools when in use, as shown in No. 3, Fig. 2. Fig. 2, No.

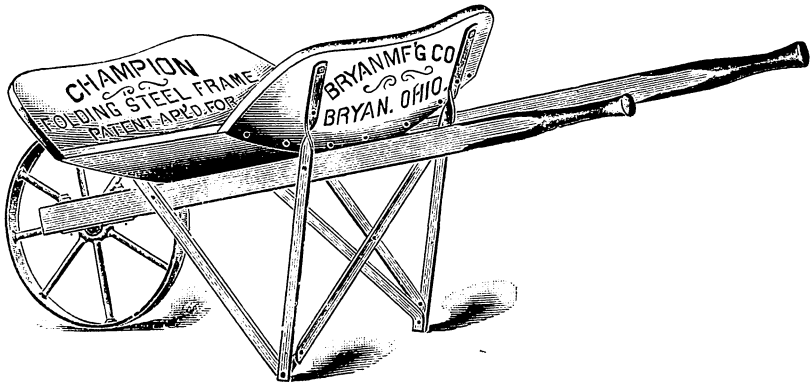


Fig. 1.—Champion Barrow Set Up.

of being folded, and Fig. 3, as folded ready to ship or to store. It is stated that the space required to ship or store

combinations of these goods. No. 4 is a size especially designed and constructed for mechanics' use and is also a useful

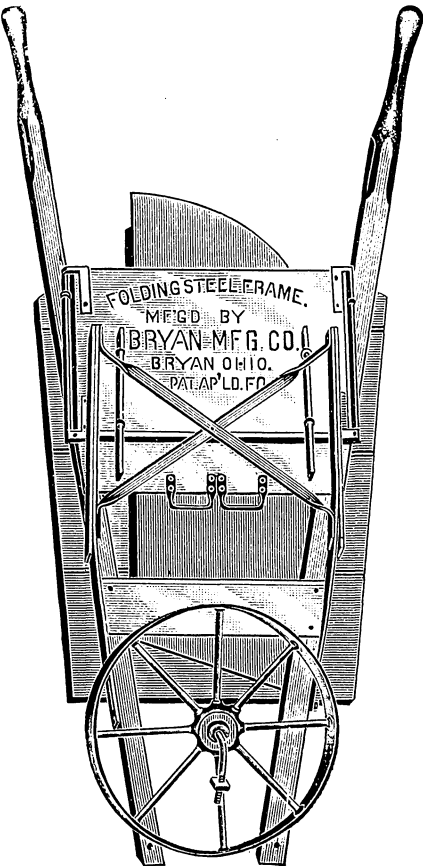


Fig. 4.—Folding Garden Barrow.

the barrow is one-fifth that has been required heretofore. The point is made that this form is desirable for the jobber, retailer and contractor, also for the export trade, as the handles, frame and bolts occupy but a space of 3 x 5 x 60

and practical tool for locomotive engineers. It comprises the wrench—10-inch handle and square jaws—square and Morse taper sockets, with feed nut; also screw feed attachment for use where space is limited.

The Improved Henry Combination Haft

Horace E. Britton, Stoughton, Mass., is offering an improved haft with 12 tools, as shown in the accompanying cut. The improvement consists of a tempered steel pin or stud, secured between the quarters of the chuck at the

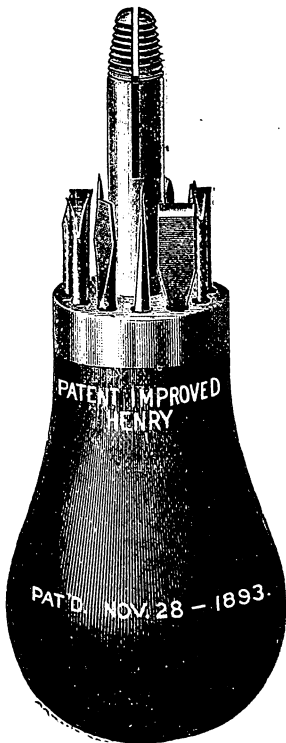


Fig. 1.—The Improved Henry Combination Haft.

1, represents the chuck of the old style Henry combination hafts with the shoulders exposed to view, which are

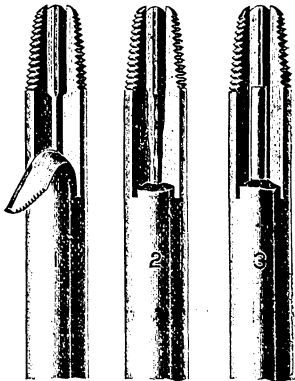


Fig. 2.—Construction of Chucks.

meant for a rest or support for the shank of the tools, and has proved to be its weak point; while No. 2 shows the old

style chuck with the shoulders broken down by the shank of a tool having been driven away up between the quarters of the chuck, causing a lasting injury that renders the haft almost worthless. The new chuck, it is stated, obviates all chance of such accidents. The tools, Fig. 3, include five brad awls, one chisel, screw driver, diamond pointed awl, marking awl, countersink, tack puller and reamer. The advantages claimed for the haft are as follows: It carries the tools in the same end of the holder in which they are used; it necessitates no shift-

bloom Galvanized Iron Sheets," Eagle brands. They experienced last season quite a demand for genuine Iron Sheets, and claim that consumers are not slow to recognize the high quality of the Eagle brand.

Trade Publications.

WE HAVE RECEIVED from the Sheffield Car Company, Three Rivers, Mich., a catalogue descriptive of the light cars made by them. The velocipede cars made by this

carriage makers, machine shops, &c., are described in a catalogue just received from the Geo. Burnham Company of Worcester, Mass. We are informed that a good trade has been developed in clamp drills, of which two styles and two sizes of each style are now made. The latest addition to this business is a line of light drill presses from one to three spindles.

THE DICK & CHURCH simple tandem compound, cross compound and triple expansion engines built by the Phoenix Iron Works Company of Meadville, Pa., are described in a recent catalogue. All these engines combine simplicity of construction with concentration of large power in small space and closeness of regulation.

FROM A CATALOGUE describing the electrical machinery made by the H. C. Fish Machine Works of Worcester, Mass., we take the following: Electrical transmission has generally been considered to be economical only over distances impracticable with belting and shafting or even rope transmission. But as the electrical business develops it is becoming a factor even in short distance work, on account of its flexibility. It is found possible and economical to drive separate lines of shafting by independent motors, thus preventing a breakdown in one department from affecting the others. Tools which it is desirable to move about, such as portable drilling machines, &c., can be located where desired and supplied with power by tapping the nearest mains. But it is in longer transmissions that electricity has its best field. In competition with troublesome rope transmissions and small independent steam plants it greatly excels, in the first case because of the little attention required and reliability as compared with ropes; and in the second case, because of its lower first cost and higher efficiency. It is well known that a large engine can be run at a lower cost per horse-power than a small one. Hence it is most economical to concentrate the power in a large engine centrally lo-

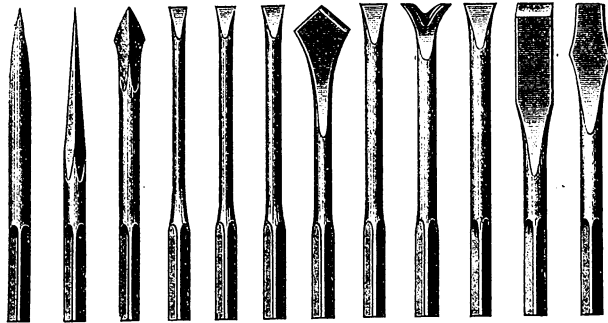


Fig. 3.—Tools Furnished with Haft.

ing of the holder end for end in changing tools; the tools do not need to be shaken out into the hand to select the one wanted; the same motion that loosens the tool in use removes the cap that covers the surplus tools; no wrench is used, and the haft can safely be used with a mallet or hammer without material injury.

New Sideboard Refrigerator.

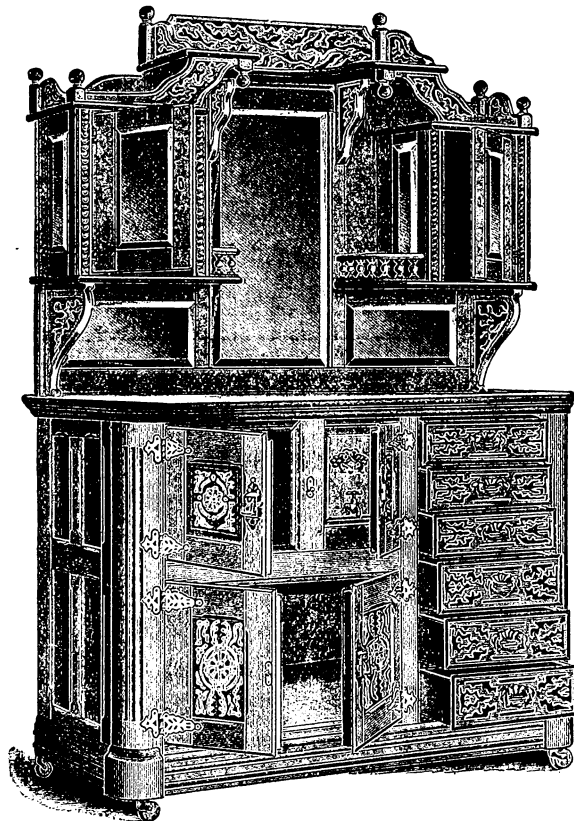
The accompanying illustration is a general view of a new sideboard refrigerator known as No. 038, put on the market by the Challenge Corn Planter Company, Grand Haven, Mich. It is a very complete and elaborate sideboard refrigerator, and is referred to as especially useful for a club house, though it makes a convenient dining room sideboard as well. One side of the refrigerator has drawers, as shown in the cut, for the storage of table linen, silverware and such articles, while on the other side is the refrigerator proper, which is made the same as in the other refrigerators of this concern. The water cooler, faucet and cup holder are in a recess, to which there is a door, as shown, so that they are entirely hidden when the door is closed. The cooler itself is a drawer which can easily be taken out and cleaned the same as any ordinary dish. The sideboard top has two cabinets, with glass panels in the ends and glass doors in front for the display of bric-a-brac, &c. Between these cabinets is a large French plate mirror. The wood is elaborately carved, as shown, and the trimmings are of bronze, while the whole is furnished with patent casters, floor plates and locks.

The McDaniel & Harvey Co. of Philadelphia, Sheet Iron manufacturers, have recently made some important additions to their plant. They have installed a complete modern plant for making Painted and Corrugated Iron Sheets, Curved Sheets and Standing Seam and Roll and Cap Roofing. The plates will be rolled in their own mills and the manufacture completed in their own works. They will continue to make Galvanized Steel Sheets and their "genuine old fashioned Charcoal

company have long been well known. The latest patterns of these and of many types of hand cars are clearly illustrated and described in the catalogue.

A PAMPHLET from the Sebastian-May Company of Sidney, Ohio, describes the foot and engine lathes, emery grinders and grindstone frame built by them.

"EVERYTHING FOR THE SMITHSHOP" is the title on a catalogue used by Day Brothers of 419 North Second street, Phila-



New Sideboard Refrigerator.

delphia. This includes forges, machines, tools, iron, steel, bolts, and in fact all the materials and implements required by the blacksmith.

HAND AND POWER DRILLS of different patterns and sizes, suitable for blacksmiths,

cated, rather than to distribute it among a number of smaller steam plants. Then it is a matter solely of location of the work to be done and convenience whether this power can be most economically transmitted and subdivided by electricity or otherwise.

Current Hardware Prices.

JANUARY 17, 1894.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range 'of price; thus discount 50&10@60&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 60 and 10 and 5 %.

Adjusters, Blind—

Domestic..... doz \$3.00, 33½¢@33½¢&10%
Excelsior..... doz \$10.00..... 60&10&2%
North's..... list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

American—
Eagle Anvils, 12 in. twist..... 15&15&5%
Horse shoe brand, Wrought..... 11&11%
Moore & Barnes Mfg. Co..... 33½¢

Imported—

Armitage Mouse Hole..... 10¢@11¢
S. & H., machine finished..... 10¢@11¢
Trenton..... 10¢@11¢
Wilkinson's..... 10¢@11¢
Peter Wright's..... 11¢@11½¢

Anvil Vise and Drill—

Allen Anvil and Vise \$3.00..... 40&10%
Cheney Anvil and Vise..... 25%
Millers Falls Co., \$18.00..... 20%
Star..... 45&5%

Apple Parers—See Parers Apple, &c.

Augers and Bits—

Boring Machine Augers..... 70&70&10%
Car Bits, 12 in. twist..... 30&10%
Common Augers and Bits..... 70&70&10%
Cincinnati Bell-Hangers' Bits..... 80&10%
Forstner Pat. Auger Bits..... 15%
Jennings' Pattern Car Bits..... 40%
Jennings' Pattern Auger Bits..... 60%
C. E. Jennings & Co., No. 10, extension..... 40%
C. E. Jennings & Co., No. 30..... 60%
C. E. Jennings & Co., Auger Bits, set 32½ quarters, No. 5, \$5; No. 30, \$3.50, 25%
Russell Jennings' Augers and Bits, 25&10%
Lewis' Patent Single twist..... 45%
L'Hommedieu Car Bits..... 15&10%
Pugh's Black..... 20%
Pugh's Jennings Pattern..... 30%
Snell's Bits..... 60&5%

Bit Stock Drills—

Cleveland..... 50&10&5%
Cincinnati, for wood..... 30&10%
Cincinnati, for metal..... 45&10%
Morse Twist Drills..... 50&10&5%
New Process Twist Drill Co..... 50&10&5%
Standard..... 50&10&5%
Syracuse, for metal..... 50&10&5%
Syracuse, for wood (wood list), 80&10&5%

Expansive Bits—

Clark's small, \$18; large, \$26, 35&35&10%
Ives' No. 4, doz \$80..... 40%
Steers', No. 1, \$26; No. 2, \$18..... 35&40%
Stearns' No. 2, \$48..... 20%
Swan's..... 40%

Gimlet Bits—

Bee..... 25&25&5%
Common..... doz gross \$2.75@3.25
Diamond..... doz \$1.25..... 40&10%
Double Cut..... 45&45&10%
Shepardson's..... 45&45&10%
Ct. Valley Mfg. Co..... 30&10%
Hartwell's..... doz gross, \$10.00..... 40&10%
Douglass'..... 40&10%
Ives..... 60&60&10%

Hollow Augers—

Bonney's Adjustable, doz \$48..... 50%
Cincinnati Adjustable..... 25&10%
Cincinnati Standard..... 25&10%
Douglass'..... 33½¢@33½¢&10%
French, Swift & Co. (Beecher)..... 33½¢@33½¢&10%

Ives' Expansive, each \$4.50..... 50&5%
Stearns'..... 20&10%
Universal Expansive, each \$4.50..... 20%
Wood's..... 25&25&10%

Ship Augers and Bits—

L'Hommedieu's..... 15&10&15&10&5%
Snell's..... 25&25&10%
Snell's Ship Auger Pattern Car Bits..... 15&10&15&10&5%
Watrous'..... 25&25&10%

Awl Hafts—See Hafts, Awl.

Awls—

Awls, Sewing, Common..... gr. 85¢@90¢
Awls, Should. Peg..... gr. \$1.50@1.55
Awls, Pat. Peg..... gr. 36¢@38¢
Awls, Shouldered Brad..... gr. \$1.30@1.40
Awls, Handled Brad..... gr. \$2.50@3.00
Awls, Handled Scratch..... gr. \$4.00@4.50
Awls Socket Scratch..... doz \$1.10@1.20

Awl and Tool Sets—See ts, Awl and Tool.

Axes—

First quality, best brands..... Plain. Beveled. \$7.00 \$7.50
First qual., other brands..... 6.75 7.00
Second quality..... 5.50 6.00

Axle Grease—See Grease, Axle.

Axles—

No. 1..... 3¼¢@4¢; 4¼¢@5¢
Nos. 7 to 14..... 70¢
Nos. 15 to 28..... 47½¢
Nos. 19 to 22..... 70¢
Concord Axles, loose collar..... 46¢@5¢
Concord Axles, solid collar..... 56¢@6¢

Bag Holders—See Holders, Bag.

Balances—

Spring Balances..... No. 2000 20 30 40%
Chatillon, doz..... \$0.80 0.95 1.75 net
Chatillon Straight Balances..... 40%
Chatillon Circular Balances..... 50&10%

Barb Wire—See Wire, Barb.

Bars—

Crow—
Cast Steel..... doz \$3 50
Iron, Steel Points..... doz \$3 50

Basins, Wash—

Standard Fiberware, No. 1, 10½ in., \$1.80;
12 in., \$2.00; 13½ in., \$2.50; 15 in., \$3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82..... 50&10&5%
Chatillon's No. 1..... 50&10&5%
Chatillon's No. 2..... 50%
Custer's..... 33½¢

Beaters—

Egg—
Bryant's..... gross \$14.00
Double (H. & R. Mfg. Co.), gro., No. 0 \$12.00; No. 1, \$15.00; No. 2..... \$36.00
Dover (Standard Co.), doz \$1.00@1.20
Duplex (Standard Co.), doz \$1.00
Duplex Extra Heavy (Standard Co.), doz \$1.00
Easy (H. & R. Mfg. Co.), doz \$3.50
Improved Acme (H. & R. Mfg. Co.), doz \$3.00
Silver & Co., doz \$5.50
Spiral..... gro \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.), gro \$16.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2..... 20%

Bells—

Cow—
Common Wrought..... 60&10%
Kentucky Durham..... 70&10%
Kentucky, Sargent's list..... 70&10%
Kentucky, "Star"..... 20&10%
Texas Star..... 50&10&50&10&5%
Western, Sargent's list..... 70&10%

Door—

Crank, Brooks'..... 50&10&2%
Crank, Cone's..... 10%
Crank, Cone's..... 20&10%
Gong, Abbe's..... 33½¢@33½¢
Gong, Barton's..... 40&10&50%
Gong, Yankee..... 45&10%
Lever, R. & E. Mfg. Co.'s..... 60&10&2%
Lever, Sargent's..... 60&10%
Lever, Taylor's Bronzed or Plated..... net
Lever, Taylor's Japanned..... 25&10%
Full, Brooks'..... 50&10&2%

Electric—

Bigelow & Dowse..... 20%
Wollensak's..... 20%

Hand—

Extra Heavy Brass..... 70%
Light Brass..... 70&10&70&10&5%
Silver Chime..... 33½¢@33½¢
White..... 70%
Globe Cone's Patent..... 25&10&35%

Miscellaneous—

Call..... 45&50%
Farm Bells..... doz \$3.50@3.75
Steel Alloy Church and School Bells..... 40%

Bellows—

Blacksmiths'..... 60&10&50&10&10%
Hand Bellows..... 40&10&50%
Molders'..... 40&10&50%

Belting, Rubber—

Common Standard..... 75&75&10%
Extra..... 60&10&60&10&10%
Standard..... 70&5&70&10%
N.Y.B. & P. Co., Carbon..... 60&60&5%
N.Y.B. & P. Co., Diamond..... 60&60&5%
N.Y.B. & P. Co., Para..... 40&40&5%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire

Detroit Perfected Tire Bender..... 15%
Green River Tire Benders and Upsetters..... 20%
Stoddard's Lightning Tire Upsetters..... 15%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron, 60&60&10%
Moore's Novelty, Mal. Iron..... 50%
Sure Grip Steel Tackle Block..... 25%
See also Machines, Hoisting.

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84..... 80&10%
Genuine Eagle, Norway, list Oct. '84..... 80&5&80&10%
Eagle, Norway, list Oct. '84..... 80&5&80&10%
Phila. pattern, list Oct. 7, '84..... 80%
R.B. & W., old list..... 70%
Bolt Ends, list Jan. 1, 1890, 80&10&80&20%
Machine, list Jan. 1, 1890, 80&10&80&20%

Door and Shutter—

Cast Iron Barrel, Square, &c..... 70&10%
Cast Iron Chain (Sargent's list)..... 65&10%
Cast Iron Shutter Bolts..... 70&10%
Ives' Patent Door Bolts..... 60&10&60&10&5%
Wrought Barrel..... 70&10&75%
Wrt B. K. Flush, Common..... 55&10%
Wrt Shutter, Brass Knob..... 60&50&5%
Wrt Shutter, Sargent's list..... 60&10%
Wrt Shutter, all Iron, Stanley's..... 60&10&60&10&10%
Wrought Square..... 70&10&75%
Wrt Sunk Flush, Sargent's list..... 60&10%
Wrt Sunk Flush, Stanley's list..... 50&10&5%

Stove and Plow—

Plow..... 60&10&5&60&10&10%
Stove..... 60&10&60&10&10%
R. B. & W., Plow..... 65%

Tire—

Common, list Feb. 28, '83..... 65&65&5%
American Screw Company.....
Norway, Phila., list Oct. 16, '84..... 75%
Eagle, Phila., list Oct. 16, '84..... 80%
Phila., list Oct. 16, '84..... 80%
Bay State, list Feb. 28, '83..... 65%
Port Chester Bolt and Nut Company.....
Empire list Feb. 28, '83..... 65%
Keystone, Philadel., list Oct. '84..... 80%
Norway, Phila., list Oct. '84..... 75%
R. B. & W., Philadel., list Oct. 16, '84..... 80%

Bores, Tap—

Common and Ring..... 20&10%
Clark's..... 33½¢@35%
Enterprise Mfg. Co..... 20%
Ives' Tap Bore..... 33½¢@35%

Borax—

Per lb..... 9¢@10¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon—

Per b..... 24%

Boxes, Miter.

Spilker's Excelsior, 3 in. \$7.50, 4 in. \$8.50, 5 in. \$13.00, 6 in. \$15.00..... 20%

Braces—

American Bit Brace and Tool Co.....
Nos. 10, 12, 20..... 60&10%
Nos. 11, 21, 24, 27..... 70&10%
Nos. 22, 23, 25..... 60&10&5%
Nos. 13, 26, 36, 37..... 70&10&5%
Amidon's.....
Barker's Imp'd Plain..... 75&10&80%
Barker's Imp. Nickeled..... 65&10&70%
Ratchet..... 75&10&80%
Eclipse Ratchet..... 60%
Globe Jawed..... 40&40&10%
Corner Brace..... 40&40&10%
Universal, 8 in., \$2.10; 10 in. \$2.25
Buffalo Ball..... \$1.10@1.15
Barber's..... 60&10%
Bartholomew's.....
Nos. 25, 27 and 30..... 50&10&60&5%
Nos. 117, 118, 119..... 70&70&5%
Common Ball, American..... \$1.00@1.10
Davis Patent..... 60&10%
Fray's Genuine Spofford's..... 50&50&10%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414..... 50&10%
Ives' New Haven Novelty..... 70&70&5%
New Haven Ratchet..... 60&5&60&10%
Barber Ratchet..... 60&5&60&10%
Barber's..... 60&5%
Spofford, Co. Peck's Patent..... 60&5&60&10%
Rose & Johnson..... 60%
Saxton's.....
Barker's Imp. Polished..... 75&10&80%
Barker's Imp. Nickeled..... 65&10&70%
Ratchet, Polished..... 60&10&60%
Ratchet, Nickeled..... 40&10&60%
Buffalo Ball..... net, \$1.10@1.15

Brackets—

Shelf, fancy, Sargent's list..... 70&70&10%
Other makes at a wide range of prices.
Shelf, plain, Regular, list..... 65&70%
Sargent's list..... 60&10&70&10%
Bradley Shelf Brackets..... 70&10%

Bright Wire Goods—See Wire.

Broilers—

Hanging, (Per doz.) 9 10 9 11
Basting..... \$4.50 5.50 6.50
Morgan Odorless..... doz \$12, 60%
New Haven..... 50%
Queen City..... 33½¢
Wire Goods Co..... 65&10%

Buckets, Well—

Helwig's Flat Iron Band..... \$7.75
Helwig's Wired Top..... doz \$4.00
Hill's..... doz 12 ct. \$4.25; 14 ct. \$6.25
Iron Clad..... doz 14 ct. \$4.25@4.50

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butchers.

Butts—

Brass—
Cast Brass, Fast..... 33½¢@10%
Cast Brass, Loose Joint..... 33½¢@10%
Cast Brass, Tiebout's..... 50%
Wrought Brass..... 80&80&10%

Cast Iron—

Fast Joint, Broad..... 50&10&60%
Fast Joint, Narrow..... 50&10&5&60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..... 75&50%
Loose Pin, Acorns..... 75&10%
Loose Pin, Acorns, Japanned..... 85%
Plated Tips.....
Mayer's Hinges.....
Parliament Butts.....
Wrought Steel—
Fast Joint, Broad.....
Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Inside Blind, Light.....
Inside Blind, Regular.....
Loose Joint, Broad.....
Loose Pin.....
Table Butts, Back Flaps, &c.....
Bronzed Wrought Butts..... 50&50&10%

Cages, Bird—

Hendryx, Brass or Enameled..... 60&10%
Hendryx, Wood..... 40&10%

Calipers—See Compasses

Calks Toe—

Burke's, One Prong, Blunt..... 54¢@6¢
Burke's, One Prong, Sharp..... 64¢@7¢
Burke's, Two Prong, Blunt..... 74¢@8¢
Gautier, One Prong, Blunt..... 54¢@6¢

Can Openers—See Openers, Can.

Cans, Milk—

S. & Co., 5-gal., \$3.00; 8-gal., \$4.40;
10-gal., \$4.75 each..... 40&10%

Cans, Oil—

Galvanized Blue Band, 1 gal., doz \$2.25
Galvanized Blue Band, 5 gal., doz \$12.00
Galvanized Blue Band, 5 gal., Faucet, doz., \$8.00
Glass Oil, Friend..... doz \$2.75

Caps—

Percussion—
Hicks & Goldmark's and Union Metallic Cartridge Co..... \$1 000
Eley's E. B..... 50&50%
Eley's D. Waterproof, Central Fire..... \$1.60
E. B. Grnd. Edge, Cent. Fire, 1-10's..... 47¢@50¢
E. B. Trimmed Edge, 1-10's..... 47¢@50¢
F. L. Waterproof, 1-10's..... 35¢@37¢
G. D..... 27¢@30¢
Musket, Waterproof, 1-10's..... 50¢@53¢
S. B. Genuine Imported..... 45%

Primers—

Berdan Primers, \$1.00.....
B. L. Caps (Sturtevant Shells) \$1 00..... 2%
All other Primers, \$1.20..... 2%

Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891..... 25%

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

B. B. Caps, Con. Ball, Swgd., \$2.00..... 2%
B. B. Caps, Round Ball, \$1.75..... 2%
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal. \$1.75..... 2%
Blank Cartridges, 32 cal. \$3.50..... 2%
Cent. Fire, Military and Sporting..... 15&5&2%
Cent. Fire, Pistol and Rifle..... 25&5&2%
Primed Shells and Bullets..... 15&5&2%
Rim Fire Cartridges..... 15&5&2%
Rim Fire Military..... 15&5&2%

Carpet Sweepers—

See Sweepers, Carpet.

Casters—

Bed..... Brasses..... 55&55&10%
Plate..... Brasses..... 60&60&10%
Shallow Socket..... 60&60&10%
Deep Socket..... 40&10%
Giant Truck Casters..... 35%
Gwinner's Common Sense..... 45%
Gwinner's Hercules..... 45%
Martin's Patent (Phoenix) 45&10&50&10%
Payson's Anti-friction..... 70&70&10%
Payson's Truck..... 60&60&10%
Socket Truck Casters..... 50&50&10%
Stationary Truck Casters..... 50&50&10%
Trucker's Patent, low list..... 45%
Yale Casters, low list..... 45%
Yale, Gem..... 70%

Cattle Leaders—

See Leaders, Cattle.

Cement—

Victor Elastic..... 6 in. pails \$7 50

Chain—

American Coll. in cask lots,
3-16 5-16 7-16 9-16 11-16 13-16
\$7.00 6.90 4.45 3.80 3.55 3.60 3.40 3.25
Less than cask lots, add 1%
German Coll. list July 13, 1893 60&60&10%
German Halter Chain, list July 12, 1892, 60&60&10%

Trace, Wagon and Fancy Chains.....
List revised May, 1893..... 60&60&10%
Barnes' Reinforced Sash..... 60&10%
Barnes' Victor Sash..... 65%
Covert Halter..... 60&25%

Chalk Lines—See *Lines*.
Checks, Door—
 Unity 50¢
Chisels—
Socket Framing and Firmer
 Mix 50¢
 New Haven 75¢
 Ohio Tool Co. 75¢
 P. S. & W 10¢
 Withby 30¢
 Buck Bros 75¢
 Douglass 75¢
 Merrill 80¢
 L. & I. J. White 80¢
Tanged and Miscellaneous—
 Buck Bros 30¢
 Butchers' 5¢
 Cold Chisels, fair quality, 1/2" 14¢
 Spear & Jackson's 5¢
 Tanged Firmer 50¢
Chucks—
 Beach Pat. each, \$8.00 20¢
 Danbury each, \$6.00, 30¢
 Graham Patent 35¢
 Morse's Adjustable, each, \$7.00, 20¢
 Syracuse, Ball Pat. 25¢
 Skinner's Patent Chucks 25¢
 Combination Lathe Chucks 35¢
 Drill Chucks 15¢
 Independent Lathe Chucks 40¢
 Universal Lathe Chucks 40¢
 Union Mfg. Co. 40¢
 Independent 40¢
 Universal 40¢
 Victor \$8.50, 25¢
Churns—
 McDermald Star Barrel Churn, each 6 gal., \$2.00; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25.
 Tiffin Union, each, 6 gal. \$3.25; 7 gal., \$3.75; 10 gal., \$4.25.
Clamps—
 Adjustable, Cincinnati 15¢
 Adjustable, Hammers 15¢
 Adjustable, Stearns' 30¢
 Barnes' Machinists' Clamps 35¢
 Cabinet, Sargent's 70¢
 Carpenters', Cincinnati 40¢
 Carriage Makers', P. S. & W. Co. 40¢
 Carriage Makers', Sargent's 75¢
 Eberhard Mfg. Co. 40¢
 R. I. Tool Co.'s Wrought Iron 25¢
 Saw Clamps, See *Saws*, Saw Folders.
 Stearns' Adjustable Cabinet and Corner 40¢
 Warner's 40¢
Creasers, Butchers'—
 Beatty's 40¢
 Bradley's 25¢
 Foster Bros 30¢
 New Haven Edge Tool Co.'s 40¢
 P. S. & W. Co. 35¢
 Schulte, Lohr & Co. 40¢
 L. & I. J. White 20¢
Clips—
 Baker Axle Clips 25¢
 Norway, Axle, 1/4" & 5/16" 55¢
 Norway Spring Bar Clips, 5/16" & 5/8" 55¢
 2d grade Norway Axle, 1/4" & 5/16" 55¢
 Steel Felloe Clips 60¢
 Superior Axle Clips 60¢
 Wrought Iron Felloe Clips 5¢
Cloth and Netting, Wire—
 See *Wire*, &c.
Cocks, Brass—
 Hardware List (Globe, Kerosene, Lever, Bibbs, Racking, &c.) 60¢
Coffee Mills—See *Mills*, *Coffee*.
Collars, Dog—
 Brass, Pope & Stevens' List 40¢
 Chapman Mfg. Company, new list 40¢
 Embossed, Gilt, Pope & Stevens' List 30¢
 Leather, Pope & Stevens' List 40¢
 Medford Fancy Goods Co. 40¢
Combs, Curry—
 American Curry Comb Co. 35¢
 Fitch's 50¢
 Kohler's Humane 15¢
 Kohler's Magic Oscillating 25¢
 Rubber, each, \$10.00 25¢
Compasses, Dividers &c.—
 Compases, Calipers, Dividers, 70¢
 Bemis & Call Co.'s 65¢
 Calpers, Call's Patent Inside 55¢
 Calpers, Double 55¢
 Calpers, Inside or Outside 55¢
 Calpers, Wing 60¢
 Compases 50¢
 Excelsior 50¢
 Starrett's 50¢
 Combination Dividers 25¢
 Lock Calipers and Dividers 25¢
 Spring Calipers and Dividers 25¢
 Stevens & Co.'s 25¢
Coolers, Water—
 S. S. & Co.: 2 gal., \$2.00; 3 gal., \$2.50; 4 gal., \$2.75; 6 gal., \$3.40 each 35¢
Coopers' Tools—
 See *Tools*, *Coopers'*.
Cord—
 Braided, Crown Drab and Fancy, 1/2" 50¢
 Braided, Crown White, 1/2" 50¢
 Cable Laid Italian Sash 19¢
 Common 12¢
 Common Russia Sash 12¢
 Egyptian, India Hemp, Braided 28¢
 India Cable Laid Sash 11¢
 Massachusetts, White 25¢
 Ossawaun Mills 10¢
 Braided, Giant, Drab and Fancy, 1/2" 35¢
 Braided, Giant, White, 1/2" 30¢
 Patent, good quality 10¢
 Patent Russia Sash 13¢
 Samson 42¢
 Braided, Drab Cotton 42¢
 Braided, Italian Hemp 40¢
 Braided, Linen 50¢
 Braided, White Cotton 28¢
 Semper Idem, Braided, White 28¢
 Silver Lake 25¢
 A quality, Drab, 55¢ 25¢
 A quality, White, 50¢ 25¢
 B quality, Drab, 35¢ 10¢
 B quality, White, 30¢ 10¢
 Sylvan Spring, Extra Braided, Drab 34¢
 Sylvan Spring, Extra Braided, White 34¢
 Tate's Solid Braided 27¢
 Economy, Drab 22¢
 Economy, White 22¢
 Hercules, Drab 30¢
 Hercules, White 25¢
 1 1/2" Cotton Braided, fair, 1/2" 23¢

Wire Picture—
 Braided or Twisted 80¢
Corkscrews—See *Screws*, *Cork*.
Corn Knives and Cutters—
 See *Knives*, *Corn*.
Crackers, Nut—
 Acme 50¢
 Japanned, 1/2" gro., \$30 50¢
 Nickel Plated, 1/2" gro. \$30 10¢
 Blake's Patent, 1/2" doz. \$2.00 10¢
 Table (H. & B. Mfg. Co.) 40¢
 Turner & Seymour Mfg. Co. 50¢
Cradles—
 Grain 50¢
Crayons—
 White Crayons, 1/2" gross 7¢
 D. M. Steward Mfg. Co. 25¢
 Metal Workers' 1/2" gross, \$2.50 25¢
 Railroad, 1/2" gross, 2.00 25¢
 Rolling Mill, 1/2" gross, 2.50 25¢
 Soapstone Pencils, 1/2" gross, 1.50 25¢
 See also *Chalk*.
Creamery Pails—See *Pails*, *Creamery*.
Crow Bars—See *Bars*, *Crow*.
Curry Combs—
 See *Combs*, *Curry*.
Curtain Pins—
 See *Pins*, *Curtain*.
Cutters—
Meat—
 American 30¢
 Nos. 1, 2, 3, 4, 5 5¢
 Each \$5, \$7, \$10, \$25, \$50, \$80
 Enterprise 25¢
 Nos. 1, 2, 3, 4, 5 25¢
 Each \$3, \$2.50, \$4, \$6, \$15
 Dixon's, 1/2" doz. 40¢
 Nos. 1, 2, 3, 4, 5 40¢
 Draw Cut, each \$14.00, \$17.00, \$19.00, \$30.00
 Nos. 1, 2, 3, 4, 5 20¢
 Hale's, 1/2" doz. 20¢
 Nos. 1, 2, 3, 4, 5 12¢
 Home No. 1, 1/2" doz. 25¢
 Little Giant, 1/2" doz. 40¢
 Nos. 1, 2, 3, 4, 5 35¢
 Miles' Challenge, 1/2" doz. 45¢
 Nos. 1, 2, 3, 4, 5 15¢
 Triumph No. 505, 1/2" doz. 25¢
 Wadsworth's, 1/2" doz. 40¢
 Nos. 1, 2, 3, 4, 5 15¢
 Beef Shavers (Enterprise) 20¢
 Chadborn's Smoked Beef Cutter, 1/2" doz. \$6.00
Slaw and Kraut—
 Tucker & Dorsey Mfg. Co. 40¢
 Kraut Cutters, 1 Knife, 1/2" gross, \$21.00
 Slaw Cutters, 2 Knife, 1/2" gross, 30.00
Tobacco—
 Acme 20¢
 All Iron 42¢
 Champion 20¢
 Nashua Lock Co.'s, 1/2" doz. 18¢
 Sargent's 22¢
 Wilson's 55¢
Washer—
 Appleton's 16¢
 Bonney's 30¢
 Cincinnati 25¢
 Johnson's 11¢
 Penny's 14¢
 Smith's 12¢
Diggers, Post Hole, &c.—
 Cronk's Post Bars, 1/2" doz. 80¢
 Eureka Diggers, 1/2" doz. 12¢
 Fletcher Post Hole Augers, 1/2" doz. 38¢
 Gem, Improved 1/2" doz. 9¢
 Gibbs' Columbia 13¢
 Gibbs' Imperial 12¢
 Gibbs' National 12¢
 Gibbs' Post Hole Digger 15¢
 Kohler's Hercules 14¢
 Kohler's Invincible 12¢
 Kohler's Little Giant 18¢
 Kohler's New Champion 8¢
 Samson 34¢
 Schielder 18¢
 Shimer's Hollow Handle, 1/2" doz. 24¢
 Vaughan's Post Hole Auger, 1/2" doz. \$8.50
Dividers—See *Compases*.
Dog Collars—See *Collars*, *Dog*.
Door Checks—
 See *Checks*, *Door*.
Door Springs—
 See *Springs*, *Door*.
Drawers—
 Money, 1/2" doz. \$18.00
 Wadsworth's Improved, No. 1, 1/2" doz. \$15.00
 Wadsworth's Improved No. 2, 1/2" doz. \$18.00
 Wadsworth's Desk and Drawer, each \$7.50
 Wadsworth's Desk and Show case, each \$7.50
Drawing Knives—
 See *Knives*, *Drawing*.
Drills and Drill Stocks—
 Blacksmith's each \$1.75
 Blacksmith's Self-Feeding, each \$7.50, 20¢
 Automatic Boring Tools \$1.75
 Breast, Bartholomew's each \$2.50
 Breast, Millers Falls each \$3.00, 25¢
 Breast, P. S. & W 40¢
 Breast, Wilson's 30¢
 Chicopee Automatic Drill 20¢
 Goodell Automatic Drills 40¢
 Ratchet, Curtis & Curtis 30¢
 Ratchet, Ingersoll's 20¢
 Ratchet, Merrill's 20¢
 Ratchet, Moore's Triple Action 25¢
 Ratchet, Parker's 20¢
 Ratchet, Weston's 20¢
 Ratchet, Whitney's 20¢
 Whitney's Drill, Plain, 1 1/2" \$11.00
 Adjustable, 1 1/2" 20¢
Twist Drills—
 Cleveland 50¢
 Diamond, W. & B. 60¢
 Graham's Pat. Groove Shank, 60¢
 Morse 60¢
 New Process 60¢
 Standard 60¢
 Syracuse (Metal List) 60¢

Drill Bits or Bit Stock—
 Drills—See *Augers* and *Bits*.
Drill Chucks—See *Chucks*.
Dripping Pans—
 See *Pans*, *Dripping*.
Drivers, Screw—
 Allard's Spiral, new list 25¢
 Brace Screw Drivers 25¢
 Buck Bros 30¢
 Buck Bros' Screw Driver Bits 27¢
 Clark's Pat. 30¢
 Cincinnati 25¢
 Champion 25¢
 Dismont 50¢
 Douglass Mfg. Co. 20¢
 Ellrich's Socket and Ratchet, 25¢
 Fray's Hol. H. die Sets, No. 3, \$12.00, 45¢
 Gay & Parsons 35¢
 Goodell's Automatic 50¢
 Knapp & Cowles 60¢
 No. 2 60¢
 No. 3 60¢
 No. 4 and 00, Acme and Ideal 50¢
 Kolb's Common Sense, 1/2" doz. \$6.00
 Mayhew's Black Handle 50¢
 Mayhew's Monarch 45¢
 P. S. & W 70¢
 Sargent & Co.'s 60¢
 No. 1, Forged Blade 60¢
 No. 2, 40 and 60 60¢
 Screw Driver Bits, Parr's, 1/2" gross, \$6.25
 Screw Driver Bits 50¢
 Stanley R. & L. Co.'s 65¢
 No. 64, Varnished Handles 70¢
 No. 86 70¢
 Stearns' 25¢
 Syracuse, Screw Driver Bits, 1/2" gross, \$3.00
 C. T. Williamson Wire Novelty Co. 50¢
Egg Beaters—See *Beaters*, *Egg*.
Egg Poachers—
 See *Poachers*, *Egg*.
Electric Bell Sets—
 See *Bells*, *Electric*.
Emery—No. 4 to No. 54 to Flour, CF 46 gr. 150 gr. F.F.F.
 10-1/2" cans, 10 6¢
 10-1/2" cans, 10 6¢
 10-1/2" cans, 10 6¢
 10-1/2" cans, 10 6¢
 10-1/2" cans, 10 6¢
 10-1/2" cans, 10 6¢
Enameled and Tinned Ware—See *Ware*, *Hollow*.
Escutcheon Pins—
 See *Pins*, *Escutcheon*.
Escutcheons—
 Brass Thread 60¢
 Door Lock, Same dis. as Door Locks 25¢
 Wood 25¢
Expanded Metal—
 List No. 5.
 Door Mats, Galvanized 25¢
 Fencing, Painted Sheets 20¢
 Lathing 10¢
 Netting, Painted Sheets 20¢
 True Guards, Paneled 15¢
 Window Guards, Paneled 15¢
Extractors, Lemon Juice—
 See *Squeezers*, *Lemon*.
Fasteners, Blind—
 Austin & Eddy No. 2008 1/2" gr. \$9.00
 Mackrell's, 1/2" doz. 20¢
 Security Gravity, 1/2" gr. \$9.00
 Van Sand's Old Pat. \$15 1/2" gr. 55¢
 Van Sand's Screw Pat. \$15 1/2" gr. 60¢
 Zimmermann's 50¢
Faucets—
 B. & L. B. Co. 50¢
 West's Lock, Open and Shut Key 50¢
 Burnside's Red Cedar 50¢
 Burnside's Red Cedar, bbl. lots 70¢
 Cork Lined 70¢
 Fenn's Cork Stops 35¢
 Frary's Pat. Petroleum 60¢
 Metallic Key, Leather Lined 60¢
 60¢
John Sommers'
 1/2" Flatless Block Tin Key 40¢
 1/2" Flatless Block Tin Key 40¢
 1/2" Flatless Block Tin Key 40¢
 1/2" Flatless Block Tin Key 40¢
 1/2" Flatless Block Tin Key 40¢
 1/2" Flatless Block Tin Key 40¢
Felloe Plates—
 See *Plates*, *Felloe*.
Fibre Ware—See *Ware*, *Fibre*.
Fifth Wheels—
 Derby and Cincinnati 45¢
 Boston 50¢
Files—
Domestic—
 American 60¢
 Arcade 60¢
 Eagle 60¢
 G. & H. Barnett (Black Diamond) 60¢
 Nicholson Files, Rasps, &c. 60¢
 Nicholson (X.F.) Files 25¢
 Nicholson's Royal Files (Seconds) 75¢
 Other makers, best brands 70¢
 Fair brands 70¢
 Arcade Horse Rasps 80¢
 Chelsea Horse Rasps, Hand Cut 50¢
 Heller's Horse Rasps 50¢
 McCaffrey's Horse Rasps 50¢
 Trojan Horse Rasps 60¢
Imported—
 Butcher 20¢
 Stubbs' list 25¢

Fixtures Grindstone—
 Moore's 55¢
 P. S. & W. Co. 50¢
 Reading Hardware Co. 80¢
 Sargent's Patent 70¢
Fluting Machines—
 See *Machines*, *Fluting*.
Fluting Scissors—
 See *Scissors*, *Fluting*.
Fodder Squeezers—
 See *Squeezers*, *Fodder*.
Forks—
 Hay, Manure, &c. Asso. List, 70¢
 Hay, Manure, &c. Phila. List, 60¢
 Plated, See *Spoons*.
Frames—
Saw—
 Red, Polished and Varnished, 1/2" doz. \$1.50, 25¢
 White Vermont, 1/2" gro. \$9.00, \$10.00
Screen, Window and Door—
 Bonanza Window Screens, 50¢
 Cortland 40¢
 Empire Window Screens, 1/2" doz. \$12
 Phillips' Window Screen Frames 50¢
 Porter's Pat. Window and Door Frame, 33¢
 Stearns' Frames and Corners, 25¢
 Warner's Screen Corner Irons, 33¢
Freezers, Ice Cream—
 American 60¢
 Arctic 70¢
 Blizzard 70¢
 Boss and Pat. 60¢
 Buffalo 60¢
 Confectioners' Machine 60¢
 Crown 60¢
 Double Action Crown 60¢
 Gem 60¢
 Giant 60¢
 Good Luck 60¢
 Granite State 60¢
 Keystone, P. D. & Co., each, \$1.50, 20¢
 Model 60¢
 Peerless 60¢
 Shepard's Lightning 60¢
 Standard 60¢
 Standard Double Action 60¢
 Star 60¢
 White Mountain 60¢
 Zero 70¢
Fruit and Jelly Presses—
 See *Presses*, *Fruit* and *Jelly*.
Fruit Pickers—
 See *Pickers*, *Fruit*.
Fry Pans—See *Pans*, *Fry*.
Funnels—
 Gersdorf's Perfection, Standard and Globe, Tin, 1 gro., 10¢; 2 to 5 gro. 20¢; 5 to 10 gro. 30¢
 Copper, 1 to 6 doz., 15¢; 6 to 12 doz., 20¢; over 12 doz. 25¢
Furnaces, Soldering—
 Burgess No. 3 Gem, Copper reservoir, \$8.50
 Burgess No. 3 Gem tin reservoir, \$7.00
 Clayton & Lambert No. 1 Fire-Pot, 60¢
Fuse—Dis. 10¢ cash. 1/2" 1000 ft. Common Cotton Fuse, for dry grnd. 50¢
 Common Hemp Fuse, for dry ground, 2.50
 Double Taped Fuse, for very wet gr. 5.00
 Single Taped Fuse, for wet ground, 4.75
 Triple Taped Fuse, for very wet gr. 6.40
 Large Gutta Percha Fuse, for water 15.00
 Small Gutta Percha Fuse, for water 10.00
Gates Molasses—
 Boss, 1/2" doz. \$1.00
 No. 1, \$7; No. 2, \$8; No. 3, \$9; No. 4, \$10.
 Lincoln's Pattern 70¢
 Stebbin's Pattern 80¢
 Stebbin's Pattern 80¢
 Stebbin's Tinned Ends 10¢
 Weed's 20¢
Gauges—
 Barrett's Comb. Roller Gauge, 1/2" doz. \$8.00, \$8.50
 Hoague & Peck's Champion Gauge, Without Scale 50¢
 Without Scale 50¢
 Marking, Horse, &c. 60¢
 Stanley R. & L. Co.'s Butt and Rabbit Gauge 25¢
 Starrett's Surface, Center and Scratch, 25¢
 Wire, Brown & Sharpe's 10¢
 Wire, Morse's 25¢
 Wire, P. S. & W. Co. 10¢
 Wire, Wheeler, Madden & Co. 10¢
Gimlets—
 Nail and Spike 50¢
 Diamond Gimlets 50¢
 Eureka Gimlets 60¢
 Double Cut, Douglass' 40¢
 Double Cut, Ives' 60¢
 Double Cut, Shepardson's 45¢
Glue—
 Dated Liquid Glue 25¢
 Improved Process 25¢
 Page's Liquid 25¢
 Upton's Liquid 35¢
Glue Pots—See *Pots*, *Glue*.
Grease, Axle—
 Axle, in boxes gross \$12.00
 Dixon's Everlasting, 10-lb pails, ea. 55¢
 Dixon's Everlasting, in bxs. 1 doz 1 1/2
 English Coach, 5-lb tin pails, 1/2" doz. \$3.50
 English Coach, wooden boxes gross \$8.50
 Fraser's 1/2" doz. \$8.50
 Fraser's, in boxes gross \$9.50
 Lower grades, special brands gross \$7.00
 Tiger, 5-lb tin pails, 1/2" doz. \$2.85
 Tiger, wooden boxes gross \$7.00
Grindstones—
 Family, regular list 60¢
 Family, Cleveland Stone Co. 20¢
Grindstone Fixtures—
 See *Fixtures*, *Grindstone*.
Gun Powder—See *Powder*.
Hack Saws—See *Saws*.
Hacks Aids—
 Sewing, Brass Fer. 1/2" gr. \$1.75
 Pat. Sewing, Long, 1/2" doz. \$1.20
 Pat. Sewing, Short, 1/2" doz. 15¢
 Pat. Peg Leather Top, 1/2" doz. 45¢
 Pat. Peg, Plain Top, 1/2" doz. 40¢

Deltz Flat Key. 30¢
Mallory, Wheeler & Co. list July, '88.
60¢ 10¢ 70¢
Plate. 30¢ 2¢ 2¢
Romer's Night Latches. 15¢
R. & L. Mfg. Co., list Mar. 20, 1888.
Sargent & Co. list Aug. 1, '88. 50¢ 10¢ 70¢
Warner's Burglar Proof. 2¢ doz. \$8.00, 50¢
Yale. net prices

Elevator—

Moore's. 33¢ 2¢

Padlocks—

List June 10, 1891. 50¢ 2¢
Ames Sword Co. up to No. 150. 40¢
Ames Sword Co. above No. 150. 50¢
Barnes Mfg. Co. 40¢ 40¢ 10¢
Champion Padlocks. 40¢
A. E. Deltz. 40¢
Eagle. 40¢ 2¢
Eureka. 40¢ 2¢
E. T. Fraim's Keystone Scandinavian. 90¢ 40¢
1010 line. 90¢ 2¢ 5¢
120 line. 90¢ 2¢ 5¢
109 line. 70¢ 2¢ 5¢
110 line. 70¢ 2¢ 5¢
225, 610 and 100 lines. 50¢ 2¢
All other numbers. 50¢ 2¢
Horsehoe. 2¢ doz \$9, 50¢ 50¢ 10¢
Hotchkiss. 30¢
No. 1. 30¢
Norwich Lock Mfg. Co., old list. 50¢ 2¢
Romer's No. 0 to 9. 50¢ 2¢
Romer's Scandinavian. 2¢ Nos. 100 to 505. 15¢
Scandinavian. 90¢ 2¢ 5¢
Slaymaker, Barry & Co.
No. 1010 line. 90¢ 50¢
No. 41 line. 80¢
No. 61 line. 80¢
No. 21 line. 80¢
Star. 60¢
Yale Lock Mfg. Co.'s. net prices

Sash, &c.—

Attwell Mfg. Co. 25¢ 33¢ 4¢
Champion Safety list January, 1893. 70¢ 5¢
Clark's No. 1, \$10; No. 2, \$3 gr. 33¢ 4¢
Common Sense, Jap'd, Cop'd. gr \$4.00
Common Sense, Nickel Plated. gr \$10.00
Corbin's Daisy, list Feb. 15, 1888. 70¢
Davis Bronze, Barnes Mfg. Co. 60¢
Ferguson's. 33¢ 4¢
Fish (Liesche's pat.), No. 100, gr. 30¢
No. 105, gr. 30¢
Giant, list Jan. 1892. 70¢ 2¢
Hammond's Window Springs. 40¢
Hugunin's New Sash Locks. 25¢ 2¢ 5¢
Hugunin's Sash Balances. 25¢ 2¢ 5¢
Ives' Patent. 60¢ 10¢ 5¢ 60¢ 10¢ 5¢
Kempshall's Gravity. 80¢
Kempshall's Model. 60¢ 60¢ 10¢
Monarch. 50¢
Payson's Perfect. 60¢ 10¢ 10¢
Reading. 60¢ 10¢ 10¢ 60¢ 10¢ 10¢
Security. 70¢
Universal. 60¢ 10¢ 2¢
Walker's. 10¢
Wolcott's. 60¢ 10¢ 5¢

Lumber Tools—

See Tools, Lumber.

Lustro—

four-ounce bottles. 2¢ doz, \$1.75; 2¢ gross \$17.00

Machines.

Boring—

Without Angers. Upright. Angular.
Douglass. \$5.50 \$6.75.
Jennings'. 5.50 6.75. 50¢ 50¢ 5¢
Snell's, Rice's Pat. 5.50 6.75. 40¢ 10¢ 10¢
Other Machines. 2.25 2.50.
Boss, Carpenter's. 3.00
Boss, Ship Builders'. 3.85
Phillips' Patent
with Angers. 7.00 7.50.
Millers Falls. 7.50. 25¢

Fluting—

American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each. 35¢
Combined Fluter and Sad Iron. 2¢ doz \$15.00. 30¢
Crown, 4 1/4 in., \$3.50; 6 in., \$4.00; 8 in., \$6.50 each. 35¢
Crown hand Fluter, No. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25. 30¢
Crown Jewel, 6 in. \$3.50 each, 35¢
Domestic Fluter. each, \$1.50
Eagle, 5 1/2-inch Rolls, \$2.15. 35¢
Eagle, 6 1/2-inch Rolls, \$2.85. 35¢
Geneva Hand Fluter, White Metal. \$12.25
Knox, 4 1/4-inch Rolls. \$3.25 each 35¢
Knox, 6-inch Rolls. \$3.60 each 35¢
Shepard Hand Fluter, No. 85, per doz \$15.00. 40¢
Shepard Hand Fluter No. 95. 2¢ doz \$3.00. 40¢
Shepard Hand Fluter, No. 110, 2¢ doz \$11.00. 40¢

Hoisting—

Moore's Anti-Friction Differential Pulley Block. 20¢
Moore's Hand Hoist, with Lock Brake. 20¢
Moore's Rope Differential Pulley Block. 60¢
Maris & Beekley (Teal Patent). 30¢
See also Blocks.

Washing—

Fair and Square. 2¢ doz \$42.00
Anthony Wayne. 2¢ doz, No. 1, \$42; No. 2, \$36; No. 3, \$42.
Wayne American. 2¢ doz \$36.00
Wells. 2¢ doz \$54.00
Western Star 2¢ doz, No. 2, \$36; No. 3 \$39

Mallets—

B. & L. Block Co., Hickory & L. V. 30¢ 30¢ 10¢
Hickory. 20¢ 10¢ 20¢ 10¢ 10¢
Lignumvite. 20¢ 10¢ 20¢ 10¢ 10¢

Mattocks—Regular list.

60¢ 10¢ 60¢ 10¢ 5¢

Measures—

Standard Fibreware, No. 1, peck 2¢ dozen, \$3.50; 1/2 peck, \$3.00

Meat Cutters—

See Cutters, Meat.

Menders, Harness—

Per doz. \$2.00

Milk Cans—See Cans, Milk.

Mills—

Coffee—

Box and Side, list Jan. 1, 1888. 60¢ 60¢ 5¢
New prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893. 20¢
The Swift, Lane Bros. 30¢
Wadell's New Box Mills, Ideal Brand, New List. 60¢

Mining Knives—

See Knives, Mining.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Out of Season.

Muzzles—

Safety. 2¢ doz, \$3.00, 25¢

Nails—

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92. 85¢ 5¢
Tack Mfrs. list. 70¢ 5¢ 70¢ 10¢
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

| | Nos. 6 | 7 | 8 | 9 | 10 |
|-------------------------|--------|--------|--------|--------|--------|
| A. C. | 25¢ | 23¢ | 22¢ | 21¢ | 21¢ |
| American. | 9¢ 1/4 | 9¢ 1/4 | 9¢ 1/4 | 9¢ 1/4 | 9¢ 1/4 |
| Anchor. | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ |
| Ausable. | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ |
| Capewell. | 19¢ | 18¢ | 17¢ | 16¢ | 14¢ |
| C. B. K. | 25¢ | 23¢ | 22¢ | 21¢ | 21¢ |
| Champion. | 25¢ | 23¢ | 22¢ | 21¢ | 20¢ |
| Champlain. | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ |
| Clinton, Fin. | 19¢ | 17¢ | 16¢ | 15¢ | 14¢ |
| Empire Bronzed. | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ |
| Essex. | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ |
| Lyra. | 9¢ 1/4 | 9¢ 1/4 | 9¢ 1/4 | 9¢ 1/4 | 9¢ 1/4 |
| Maud S. | 25¢ | 23¢ | 22¢ | 21¢ | 21¢ |
| Northwest'n. | 25¢ | 23¢ | 22¢ | 21¢ | 20¢ |
| Putnam. | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ |
| Standard. | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ |
| Vulcan. | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ |
| Western. | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ |

Picture—

Brass Head, Combination list. 50¢ 10¢
Brass Head, Sargent's list. 60¢ 80¢ 10¢
Porcelain Head, Combination list. 40¢ 10¢
Porcelain Head, Sargent's list. 50¢ 10¢ 10¢
Niles' Patent. 40¢

Nail Pullers—See Pullers, Nail.

Nail Sets—See Sets, Nail.

Nut Crackers—

See Crackers, Nut.

Nuts—List Dec. 18, 1889.

Square. Hex.
Cold Punched. 5.00¢ 6.10¢ off list
In packages of 100 lb. add 1-10¢ lb. add net; in packages less than 100 lb. add 1¢ lb. net.
Hot Pressed. 5.80¢ 6.50¢ off list

Oakum—

Best or Government. 2¢ 6¢ 6¢ 7¢
Navy. 2¢ 6¢ 6¢ 7¢
U. S. Navy. 2¢ 5¢ 6¢ 6¢

Oil Tanks—See Tanks, Oil.

Oilers—

Zinc and Tin. 65¢ 10¢ 70¢ 5¢
Brass and Copper. 50¢ 10¢ 50¢ 10¢ 5¢
Broughton's Brass. 50¢
Broughton's Zinc. 60¢
Malleable, Hammers' Improved, No. 1, \$3.60; No. 2, \$4.00; No. 3, \$4.40 2¢ doz. 10¢ 10¢ 5¢
Malleable, Hammers' Old Pattern, same list. 45¢
Olmead's Brass and Copper. 60¢
Olmead's Tin and Zinc. 60¢
Prior's Pat. or "Paragon" Brass. 60¢
Prior's Pat. or "Paragon" Zinc. 60¢ 10¢ 10¢
Weil, Draper & Williams. 60¢
Winnet & Hobbs Mfg. Co., Steel Anti-Rust. 60¢

Openers, Can—

American. 2¢ gross \$1.75 2¢ 20¢
Champion. 2¢ doz \$2.00. 50¢
Domestic. 2¢ doz \$2.00. 45¢
Duplex. 2¢ doz 25¢, 15¢ 20¢
Eureka. 2¢ doz \$2.50, 10¢
Excelator, No. 1 \$2.50; No. 2, \$1.50. 40¢
Lyman's. 2¢ doz \$3.75, 20¢
Messenger's Comet. 2¢ doz \$3.00, 25¢
Moore's. 2¢ doz \$2.25, 55¢ 60¢
No. 4, French. 2¢ gr \$6.00, 45¢ 60¢
Sardine Scissors. 2¢ doz \$2.75, \$3.00
Sprague, No. 1, 55¢; 2, 60¢; 3, 65¢; Star. 2¢ doz \$2.75
Universal. 2¢ doz \$3.00. 55¢ 2¢
World's Best 2¢ gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00. 60¢ 10¢

Packing, Steam—

Rubber—

Standard, fair quality. 70¢ 70¢ 10¢
Inferior quality. 75¢ 80¢
Extra. 80¢ 90¢ 5¢
Jenkins' Standard. 2¢ doz \$0.25, 25¢ 25¢
Jenkins' & P. Co., Empire. 60¢
N. Y. B. & P. Co., Salamander. 25¢
N. Y. B. & P. Co., Standard. 50¢

Miscellaneous—

American Packing. 10¢ 11¢ 1¢
Cotton Packing. 15¢ 17¢ 1¢
Italian Packing. 13¢ 14¢ 1¢
Jute. 7¢ 8¢ 1¢
Russia Packing. 14¢ 1¢

Pails—

Creamery—

S. S. & Co.: 18-qt., \$7.00; 20-qt., \$7.25
2¢ doz. 5¢

Galvanized—

| | Quarts | 12 | 14 |
|--------------------------------------|--------|------|------|
| Central Stamping Co. | 2.50 | 2.75 | 3.00 |
| Fire Buckets. | 2.75 | 3.25 | 3.50 |
| Hill's Heavy Weight. 2¢ doz. | 3.00 | 3.25 | 3.75 |
| Hill's Light Weight. 2¢ doz. | 2.75 | 3.00 | 3.25 |
| Iron Clad. | 2.50 | 2.75 | 3.00 |
| Sidney Shepard & Co. | 2.50 | 2.75 | 3.00 |
| Buckets—See Well Buckets. | | | |

Indurated Fiber Ware

Fire Pails, deep. 2¢ doz \$4.80
Fire Pails, round bottom. 2¢ doz \$5.40
Milk, 14 qt. 2¢ doz \$5.40
Stable, 14 qt. 2¢ doz \$6.00
Star Pails, 12 qt. 2¢ doz \$4.20

Standard Fiber Ware—

| | Plain. | Decor'd |
|-----------------------------------|--------|---------|
| Buggy Pails. | \$3.00 | |
| Chamber Pails, 14 qt. | 4.00 | 7.00 |
| Dairy Pails, 14 qt. | 3.75 | 4.25 |
| Fire Pails, No. 1, 12 qt. | 3.75 | |
| Fire Pails, No. 2, 14 qt. | 4.25 | |
| Horse Pails. | 4.00 | |
| Slop Jars (bal. trap). | 7.50 | 8.50 |
| Sugar Pails. | 5.00 | 5.50 |
| Water Pails, 12 qt. | 3.15 | 3.75 |

Pans—Dripping—

Large sizes. 2¢ 5¢
Small sizes. 2¢ 5¢
Silver & Co. (Covered). 40¢

Fry—

| | No. | 1 | 2 | 3 | 4 |
|---------------------------------|--------|--------|--------|--------|---|
| Standard List. | 0 | 1 | 2 | 3 | 4 |
| No. | 0 | 1 | 2 | 3 | 4 |
| 2¢ doz. | \$3.75 | \$4.25 | \$4.75 | \$5.25 | |
| No. | 5 | 6 | 7 | 8 | 9 |
| 2¢ doz. | \$6.00 | \$7.00 | \$8.00 | \$9.00 | |
| Polished regular goods. | 75¢ | 75¢ | 10¢ | | |
| Acme Fry Pans. | 60¢ 4¢ | | | | |

Dust—

Steel Edge, No. 1. 2¢ doz \$1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, \$2; 20, \$2.25; 30, \$2.50 each. 60¢ 10¢

Paper and Cloth—

Sand and Emery—

List April 19, 1888. 50¢ 10¢ 50¢ 10¢ 10¢
Sibley's Emery and Crocus Cloth. 30¢

Parers—

Apple—

Advance. 2¢ doz \$4.75
Baldwin. 2¢ doz 5.25
Bonanza. each 5.00
Snowdrift. 2¢ doz 4.00
Dandy. each 7.50
Eclipse. 2¢ doz 4.00
Eureka, 1888. each 16.00
Family Bay State. 2¢ doz 12.00
Favorite. 2¢ doz 5.00
Gold Medal. 2¢ doz 3.00
Ideal. 2¢ doz 4.00
Improved Bay State. 2¢ doz \$27.00 30.00
Little Star. 2¢ doz 4.50
Monarch. 2¢ doz 13.50
New Lightning. 2¢ doz 5.50
Oriole. 2¢ doz 4.00
Perfection. 2¢ doz 4.00
Pomona. 2¢ doz 4.00
Reading 72. 2¢ doz 4.25
Reading 78. 2¢ doz 7.00
Rocking Table. 2¢ doz 6.00
Turn Table. 2¢ doz 4.50
Victor. 2¢ doz 13.50
Waverly. 2¢ doz 4.00
White Mountain. 2¢ doz 4.00

Potato—

Antrim Combination. 2¢ doz \$5.50
Hoosier. 2¢ doz \$13.50
Saratoga. 2¢ doz \$5.50
White Mountain. 2¢ doz \$4.50

Pencils, Soapstone—

See Crayons.

Pickers, Fruit—

Prize Fruit Pickers. 50¢

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$18.00. 60¢ 10¢ 50¢ 10¢ 10¢ 5¢

Picture Nails—

See Nails, Picture.

Pinking Irons—

See Irons, Pinking.

Pins—

Bow—

Humason, Beekley & Co.'s. 60¢ 10¢
Peck, Stow & W. Co. 50¢ 10¢ 50¢ 10¢ 5¢
Sargent & Co.'s, \$17 and \$18. 60¢ 10¢

Escutcheon—

Iron, list Nov. 11, 1885. 50¢ 10¢ 50¢ 10¢ 5¢
Brass. 60¢ 60¢ 25¢

Pipe, Wrought Iron—

1 1/2 and under, Plain. 57¢ 2¢ 10¢
1 1/2 and under, Galv. 57¢ 2¢ 10¢
1 1/2 and over, Plain. 87¢ 1¢ 10¢
1 1/2 and over, Galv. 87¢ 1¢ 10¢
Boiler Tubes, list Oct. 24, 1892. 65¢ 10¢
Casing, list Nov. 16, 1892. 52¢ 10¢
Cold Drawn Seamless Steel Tubing. 50¢
Inserted Joints Casing, list Nov. 16, 1892. 47¢ 2¢ 5¢
Steel Boiler Tubes. 27¢ 1¢ 5¢

Planes and Plane Irons—

Wood Planes—

Molding. 40¢ 10¢
Bench, First quality. 45¢ 10¢
Bench, Second quality. 50¢ 10¢
Bailey's (Stanley R. & L. Co.). 60¢ 10¢

Iron Planes—

Bailey's (Stanley R. & L. Co.). 50¢ 10¢
Birmingham Plane Co. 60¢ 60¢ 5¢
Chaplin's Iron Planes. 50¢ 50¢ 5¢
Davis' Iron Planes. 50¢ 50¢ 5¢
Gage Tool Co.'s Self-Setting. 20¢ 10¢ 10¢
Mer

Pullers Nail—

| | |
|-------------------|--------------------|
| Eclipse..... | doz., \$24.00, 40% |
| Economy..... | doz., \$16.00, 40% |
| Giant, No. 2..... | doz., \$18.00, 40% |
| Pelican..... | doz., \$18.00, 40% |
| Seranton..... | doz., \$18.00, 38% |

Pulleys—

| | |
|--|------------------|
| Brass Screw..... | 70% |
| Hay Fork, "Anti-Friction," 5 in. solid..... | \$5.70, 50% |
| Hay Fork, "F" Common and Patent..... | 20% |
| Hay Fork, Moore's Anti-Friction 5 in. (Wheel, 4 doz., \$12.00, 40%)..... | 40% |
| Hay Fork, Reed's Self-Lubricating..... | 80% |
| Hay Fork, Solid Eye, 50x10 to 60x10 1/2..... | \$4.50, 50% |
| Hay Fork, Tarbox Pat. Iron..... | 20% |
| Hot House, Awning, 20..... | 60% to 70% |
| Japanned Clothes Line..... | 60% to 10% |
| Japanned Screw..... | 60% to 10% |
| Japanned Sash..... | 60% to 10% |
| Moore's Ceiling or End, Anti-Friction..... | 50% |
| Moore's Dumb Weller, Anti-Friction..... | 50% |
| Moore's Electric Light..... | 33 1/3% |
| Moore's Side, Anti-Friction..... | 50% |
| Sash (Auger Mortise)..... | 50% |
| Common Sense..... | 60% |
| Empire..... | 60% |
| Acme..... | 60% |
| Ideal, Nos. 2, 4, 10 & 15..... | 30% less 1/2 |
| Star..... | doz net. |
| Ideal, Nos. 25 and 55..... | doz. 22 1/2 net. |
| On bbl. lots extra 5%..... | |
| Shade Rack..... | 25% |
| Shepard's Nine..... | 25% |
| Tackle Blocks—See Blocks..... | 45% |

Pumps—

| | |
|----------------------------------|---------------|
| Cistern, Best Makers..... | 60% to 10% |
| Pitcher Spout, Best Makers..... | 67 1/2 to 70% |
| Pitcher Spout, Cheaper G'ds..... | 75 to 75 1/2 |
| Myers' Pumps, low list..... | 50% |

Punches—

| | |
|---|------------------------|
| Avery's Revolving..... | 40% |
| Avery's Sawset and Punch—See Sawsets..... | |
| Bemis & Call Co.'s Cast Steel Drive..... | 50% to 55% |
| Bemis & Call Co.'s Check..... | 55% |
| Bemis & Call Co.'s Spring..... | 50% to 55% |
| Bemis & Call Co.'s Springfield Socket..... | 65% |
| Niagara Hollow Punches..... | 20% to 25% |
| Niagara Solid Punches..... | 55% |
| Rice Hand Punches..... | 15% |
| Saddler's or Drive, good..... | doz., 60% to 65% |
| Spring, good quality..... | doz., \$2.50 to \$2.80 |
| Spring, Leach's..... | doz., \$2.50 to \$2.80 |
| Solid Tinnings, P., S. & W. Co..... | 15% |
| \$1.44..... | 55% |
| Tinnings' Hollow Punches, P., S. & W. Co..... | 20% to 25% |

Rail—

| | |
|---|-----------------------|
| Barn Door, Light, In. 1/4..... | 3/4 |
| Per 100 feet..... | \$2.00 2.50 3.10, 10% |
| B. D. for N. E. Hangers..... | |
| Small, Med. Large..... | 2.70 3.25 Net |
| Carrier, double braced, Steel Rail..... | 3/4 to 4 |
| foot..... | 3/4 to 4 |
| Lundy Parlor Door, Planed Edge..... | ft. 7 1/2 |
| Moody Steel Rail..... | ft. 5 1/2, 45% |
| Moore's Steel Rail..... | 25% to 10% |
| Sliding Door, W. R. Iron..... | ft. 1, 7 1/2 |
| Sliding Door, Iron, Painted..... | ft. 1, 7 1/2 |
| Sliding Door, W. R. Iron..... | ft. 1, 7 1/2 |
| Terry's Steel Rail..... | ft. 4 1/2 |
| Victor Track Rail, 7 1/2 foot..... | 50% to 25% |

Rakes—

| | |
|---|-----------------------------|
| Cast Steel, Association G'ds..... | 70% to 70 1/2 to 82 1/2 |
| Cast Steel, outside g'ds..... | 70% to 70 1/2 to 82 1/2 |
| Malleable..... | 70% to 70 1/2 to 82 1/2 |
| Fort Madison Prize Bow Brace..... | 65% |
| Peerless..... | 65% |
| Fort Madison Steel Tooth Lawn Rake..... | \$8.00, 25% |
| Gibbs' Acme Lawn Rake..... | doz., \$4.75 |
| Gibbs' Canton Lawn Rake..... | doz., \$3.75 |
| Gibbs' Crown Lawn Rake..... | doz., \$4.00, No. 2, 82 1/2 |
| Gibbs' Favorite Lawn Rake..... | doz., \$3.00 |
| Gibbs' Lawn Rake..... | doz., \$4.00 |
| Onelida Lawn Rake..... | doz., \$3.00 |

Razors—

| | |
|--------------------------------------|-----------------|
| Campbell Cutlery Co..... | 50% |
| Electric Cutlery Co..... | Net prices |
| Galvanic..... | doz., \$15.00 |
| Jordan's AAA1, new list..... | Net prices |
| Jordan's Old Faithful, new list..... | Net prices |
| J. R. Torrey Razor Co..... | Net prices |
| Wostenholm and Butcher..... | \$10 to 25, 10% |

Razor Straps—

See Straps, Razor.

Registers—

| | |
|------------------------------|---------|
| Moore's Bronze Finishes..... | 70% |
| Moore's Electroplated..... | 75% |
| Moore's Japanned..... | 75% |
| Moore's Solid Bronze..... | 65% |
| Moore's Store Pipe..... | 33 1/3% |

Rings and Ringers—**Bull Rings—**

| | |
|--|-------------------|
| Ellrich Edw. Co., White Metal, low list..... | 50% to 10% |
| Hotchkiss' low list..... | 30% |
| Humason, Beckley & Co.'s..... | 70% to 10% |
| Peck, Stow & W. Co.'s..... | 50% to 10% to 10% |
| Sargent's..... | 75% to 10% |
| Union Nut Co..... | 55% |

Hog Rings and Ringers—

| | |
|-------------------------------|----------------------|
| Blair's Hog Ringers..... | doz \$2.00 |
| Blair's Hog Ringers..... | doz 90¢ to \$1.00 |
| Brown's Ringers..... | doz \$2.00 |
| Brown's Ringers..... | doz \$1.15 to \$1.25 |
| Champion Ringers..... | doz \$2.00 |
| Champion Ringers..... | doz \$2.25 |
| Electric Hog Ringers..... | doz \$1.25 |
| Electric Hog Ringers..... | doz boxes \$1.50 |
| Hill's Improved Ringers..... | doz \$1.25 |
| Hill's Old Style Ringers..... | doz \$1.12 1/2 |
| Hill's Ringers..... | doz bxs \$1.00 |
| Hill's Tongs..... | doz \$3.00 |
| Major Ringers..... | doz \$2.00 |
| Major Ringers..... | doz \$2.25 |
| Perfect Ringers..... | doz bxs \$1.50 |
| Top of the Hill Ringers..... | doz \$2.00 |
| Top of the Hill Ringers..... | doz \$1.25 |

Rivets and Burrs—

| | |
|-------------------------------------|------------|
| Norway Iron, list Nov. 17, '87..... | 60% to 10% |
| Second quality..... | 70% |
| Copper..... | 60% to 10% |
| Coppered Iron, Betina, Brand..... | 50% to 5 |

Rivet Sets—See Sets.**Roasting and Baking****Pans—See Pans, Roasting and Baking.****Rods—**

| | |
|---------------------------|------------|
| 1/2 in. Black Walnut..... | doz 40% |
| 1/2 in. Brass..... | 25% to 30% |

Rollers—

| | |
|---------------------------------------|------------|
| Acme Moore's Anti-Friction..... | 55% |
| Barn Door, Sargent's list..... | 60% to 10% |
| Moore's Barn Door Stay..... | 50% |
| Union Barn Door Roller..... | 70% |
| Thompson Mfg. Co.'s Lawn Rollers..... | 30% |

Rope—The following prices are f.o.b.

| | |
|---|----------------|
| New York or factory, and are shaded 1/2¢ to 1/4¢ on large lots; terms, 1 1/2% for cash. | |
| Manilla, 7-16 in. diam. and larger..... | 7 1/4 to 8 1/4 |
| Manilla, 1/2 in. and 5-16 in. diam..... | 8 1/4 to 9 1/4 |
| Manilla, Tarred Rope..... | 7 1/4 to 7 3/4 |
| Manilla, Hay Rope, Med'm..... | 7 1/4 to 7 3/4 |
| Sisal, 7-16 in. and larger..... | 5 1/4 to 5 3/4 |
| Sisal, 1/2 in. and 5-16 in. diam..... | 5 1/4 to 5 3/4 |
| Sisal, Tarred Rope..... | 5 1/4 to 5 3/4 |
| Sisal, Medium Lath Yarn..... | 5 1/4 to 5 3/4 |
| New Zealand..... | 5 1/4 to 5 3/4 |
| larger..... | 5 1/4 to 5 3/4 |
| New Zealand..... | 5 1/4 to 5 3/4 |
| New Zealand, Hay Rope..... | 5 1/4 to 5 3/4 |
| New Zealand, Tar'd Rope..... | 5 1/4 to 5 3/4 |
| Cotton Rope..... | 5 1/4 to 5 3/4 |
| Jute Rope..... | 5 1/4 to 5 3/4 |

Wire—

| | |
|-------------------------------------|-----|
| List February, 1892. All kinds..... | 45% |
|-------------------------------------|-----|

Rules—

| | |
|--|---------------------------------|
| Boxwood..... | 30% to 10% to 80% to 10% to 10% |
| Ivory..... | 50% to 10% |
| Starrett's Steel Rules and Straight Edges..... | 25% to 10% |

Sad Irons—See Irons, Sad.**Sand and Emery Paper****and Cloth—****See Paper and Cloth.****Sash Cord—See Cord, Sash.****Sash Locks—See Locks, Sash.****Sash Weights—****See Weights, Sash.****Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.****Saws—****Note.—Extra 5% to 10% often given.**

| | |
|---|------------|
| Atkins' Circular..... | 50% to 10% |
| Atkins' Cross Cuts, new list..... | 40% |
| Atkins' Mulay, Mill and Drag..... | 50% to 10% |
| Atkins' One-Man Saw..... | 40% |
| Atkins' Wood Saws..... | 40% |
| Drew's Circular..... | 45% to 50% |
| Disston's Cross Cut, list Jan. 1, '93..... | 40% to 10% |
| Disston's Hand..... | 25% |
| E. C. Jennings & Co.'s..... | 25% |
| Peace Circular and Mill..... | 45% to 50% |
| Peace Cross Cuts, list Jan. 1, '93..... | 45% to 10% |
| Peace Hand, Panel and Rip..... | 25% to 55% |
| Richardson's Circular and Mill..... | 45% to 50% |
| Richardson's X Cuts, list Jan. 1, '93..... | 45% to 10% |
| Richardson's Hand, &c..... | 25% to 55% |
| Simonds' Circular Saws..... | 45% to 55% |
| Simonds' Crescent Ground Cross Cut Saws..... | 30% |
| Simonds' Gang, Mill, Mulay and Drag..... | 40% |
| Wheeler, Madden & Clemson Mfg. Co. Cross Cuts, list Jan. 1, 1893..... | 45% to 10% |
| Hand, Panel and Rip..... | 30% to 10% |
| Woodrough & McFarlin..... | 45% to 10% |
| Hand, Panel and Rip..... | 25% to 10% |

Hack Saws—

| | |
|--------------------------------|------------|
| Eureka and Crescent..... | 25% |
| Griffin's, complete..... | 40% to 10% |
| Griffin's Hack Saw Blades..... | 40% to 10% |
| Star Hack Saws and Blades..... | 25% |

Scroll—

| | |
|---------------------------------------|--------------|
| Barnes' Builders' and Cab Makers..... | \$15.25, 25% |
| Barnes' Scroll Saw Blades..... | 25% |
| Lester, complete..... | \$10.00, 25% |
| Rogers, complete..... | \$4.00, 25% |

Saw Frames—**See Frames, Saw.****Saw Sets—See Sets, Saw.****Saw Tools—See Tools, Saw.****Scales—**

| | |
|--|------------------------|
| Chattillon's Eureka..... | 25% |
| Chattillon's Favorite..... | 40% |
| Chattillon's Grocers' Trip Scales..... | 50% |
| Family Turnbills..... | 30% to 10% |
| Hatch, Counter, No. 171, good quality..... | doz \$18.00 to \$19.00 |
| Hatch, Tea, No. 161..... | doz \$6.50 to \$7.00 |
| Richie's Platform..... | 40% |
| Union Platform, Plain..... | \$2.10 to 2.20 |
| Union Platform, Striped..... | \$2.40 to 2.50 |

Scale Beams—**See Beams, Scale.****Scissors, Fluting.....****Scrapers—**

| | |
|--|----------------------|
| Adjustable Box Scraper (S. R. & L. Co.)..... | \$8.00, 40% to 10% |
| Box, 1 Handle..... | doz \$2.00 |
| Box, 2 Handle..... | doz \$3.00 to \$4.00 |
| Defiance Box and Ship..... | 20% to 10% |
| Foot..... | 50% to 10% |
| Ship, Common..... | doz \$3.50 |
| Ship, R. I. Tool Co..... | doz \$3.50 |

Screen Window and Door**Frames—See Frames****Screw Drivers—****See Drivers, Screw****Screws—****Bench and Hand—**

| | |
|-------------------------------|--------------------------|
| Bench, Iron..... | 55% to 10% to 55% to 10% |
| Bench, Wood, Beech..... | doz \$2.25 |
| Bench, Wood, Hickory..... | 20% to 10% |
| Hand, Wood..... | 25% to 10% to 25% to 10% |
| Hand, Grand Rapids, list..... | 35% |

Coach, Lag and Hand-Rail—

| | |
|---|--------------------------|
| Lag, Blunt Point, list Jan. 1, 1890..... | 80% to 10% to 80% to 25% |
| Coach and Lag, Glimet Point, list Jan. 1, 1890..... | 80% to 10% to 80% to 20% |
| Hand Rail, Am. Screw Co..... | 75% |
| Hand Rail, H. & B. Mfg. Co..... | 70% to 10% to 75% |
| Hand Rail, Sargent's..... | 70% to 10% |

Jack Screws—

| | |
|--------------------------------------|-------------------|
| Jack Screws, Millers Falls list..... | 50% to 50% to 10% |
| Jack Screws, P., S. & W..... | 35% |
| Jack Screws, Sargent..... | 70% |
| Jack Screws, Stearns..... | 40% to 40% to 10% |

Cork—

| | |
|---|-----------------------|
| Detroit Cork Screw Co..... | 33 1/3% |
| Humason & Beckley Mfg. Co..... | 40% to 10% to 50% |
| Williamson's..... | 35% to 33 1/3% to 25% |
| Williamson's Forged Worm, Applewood Handle, 3 doz., \$5.00; Rosewood, \$5.50..... | 40% |

Machine—

| | |
|----------------------|-----|
| Flat Head Iron..... | 65% |
| Round Head Iron..... | 60% |

Wood—

| | |
|---------------------------|---------|
| List January 1, 1891..... | |
| Flat Head Iron..... | 70% |
| Round Head Iron..... | 65% |
| Flat Head Brass..... | 70% |
| Round Head Brass..... | 65% |
| Flat Head Bronze..... | 70% |
| Round Head, Bronze..... | 65% |
| Rogers' Drive Screws..... | 82 1/2% |

Extra 10% often given.**Scroll Saws—See Saws, Scroll.****Scythes—**

| | |
|------------|--------------------------|
| Grass..... | 40% to 50% to 40% to 10% |
| Grass..... | 40% to 10% to 50% |

Scythe Snaths—**See Snaths, Scythe.****Sets—****Awl and Tool—**

| | |
|--|---|
| Alken's Sets, Awns and Tools..... | 60% to 60% to 55% |
| Common Brad Sets..... | 70% |
| No. 42, \$10.50; No. 43, \$12.50..... | 70% to 55% |
| Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$13; 3, \$12; 4, \$9..... | 45% |
| Henry's Combination Haft..... | doz \$6.50 |
| Millers Falls Adj. Tool Hds., No. 1, \$12; No. 4, \$12; No. 5, \$18..... | 25% |
| Stanley's Excelsior..... | No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50..... 30% to 10% |

Nail—

| | |
|-----------------------------|-----------------------|
| Round..... | gr. \$3.25 |
| Square..... | gr. \$4.00 to 27 1/2% |
| Buck Bros..... | 27 1/2% |
| Cannon's Diamond Point..... | gr. \$12, 20% |

Rivet—

| | |
|-------------------|-----|
| Regular list..... | 70% |
|-------------------|-----|

Saw—

| | |
|---|--|
| Atkin's Criterion..... | doz No. 1, \$3.00 |
| Atkin's Genuine..... | \$13.00, 50% to 10% to 60% |
| Atkin's Imitation..... | doz \$3.00 to \$3.25 |
| Atkin's Lever..... | doz No. 1, \$6.00 |
| Avery's Saw Set and Punch..... | 50% |
| Bemis & Call Co.'s Cross Cut..... | 30% to 5% |
| Bemis & Call Co.'s Plate..... | 20% |
| Bemis & Call Spring Hammer..... | 40% to 5% |
| Common Lever..... | doz \$2.00, 45% to 65% |
| Crescent..... | doz \$3.00 |
| Croissant (Keller), No. 1, \$15.00; No. 2, \$24.00..... | 40% to 10% to 50% |
| Disston's Star..... | 25% |
| Hammer, Bemis & Call Co.'s new Pat..... | 45% |
| Hart's Pat. Lever..... | \$5.50, 10% |
| Kohler's King Royal..... | doz \$12.00 |
| Kohler's Royal..... | doz \$7.00 |
| Leach's..... | No. 0, \$8.00; No. 1, \$15..... 15% to 20% |
| Leopold..... | 40% to 10% to 50% |
| Merrill's No. 1..... | doz \$15, 40% to 10% |
| Merrill's No. 4..... | \$15.00, 40% to 20% |
| No. 3 and 4, Cross Cut..... | \$23.00, 40% to 20% |
| No. 5, Mill, \$31.00..... | 40% to 20% |
| No. 10, \$15.00..... | 40% to 20% |
| No. 11, \$18.00..... | 40% to 20% |
| Nash's..... | 20% to 10% to 40% |
| Stillman's Genuine..... | doz \$5.00 to 7 1/2, 45% |
| Stillman's Pattern, Hand..... | doz \$3.25 |
| Cross Cut, \$5.50..... | 55% to 55% to 10% |
| Taintor Positive..... | doz \$18, 50% |

Sharpeners, Knife—

| | |
|---------------------------|-----------------|
| Larkins..... | doz \$6.00, 40% |
| Applewood Handles..... | doz \$6.00, 40% |
| Rosewood or Cocobola..... | doz \$9.00, 40% |

Shaves, Spoke—

| | |
|-----------|-----|
| Iron..... | 45% |
| Wood..... | |

Snaps, Harness, &c.

| | |
|------------------------------------|-------|
| Anchor (T. & S. Mfg. Co.) | 65 |
| Fitch's (Bristol) | 50&10 |
| Hotchkiss | 10 |
| Andrews | 50 |
| Sargent's Patent Guarded | 70&10 |
| German, new list | 50&10 |
| Covert | 50&10 |
| Covert, New Patent | 50&10 |
| Covert, New R. E. | 50&10 |
| Covered Spring | 50&10 |
| Covert's Saddlery Works' Triumph | 50 |
| John Protz Snaps | 50 |
| Kelley & Woolworth's Steel Harness | 50&10 |

Snaths

| | |
|--------|------|
| Scythe | 50&2 |
|--------|------|

Soldering IronsSee *irons, Soldering*.**Spittoons, Cuspidors, &c.****Standard Fiberglass**

| | |
|---|----|
| Cuspidors, 8 1/2 inch, No. 5, 8; No. 6, 8 | 50 |
| Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, 8 | 50 |

Spoke ShavesSee *Shaves, Spoke*.**Spoke Trimmers**See *Trimmers, Spoke*.**Spoons and Forks****Tinned Iron**

| | |
|---|-------|
| Basting, Cen. Stamp. Co.'s list | 70&10 |
| Solid Table and Tea, Cen. Stamp. Co.'s list | 70&10 |
| Buffalo, S. S. & Co. | 35&10 |

Silver Plated

| | |
|-----------------------------|----------|
| 4 months or 5¢ cash 30 days | 40&15 |
| Meriden Brit. Co., Rogers | 40&15 |
| Rogers & Hamilton | 40&15 |
| C. Rogers & Bros. | 40&15 |
| Rogers & Bros. | 40&15 |
| Reed & Barton | 40&15 |
| Wm. Rogers Mfg. Co. | 40, 15&5 |
| Simpson, Hall, Miller & Co. | 40, 15&5 |
| Holmes & Edwards Silver Co. | 40, 15&5 |
| L. Boardman & Son | 50&12 |

Miscellaneous

| | |
|---|-------|
| Holmes & Edwards Silver Co. | 50&10 |
| No. 67 Mexican Silver | 50&10 |
| No. 30 Silver Metal | 50&10 |
| No. 24 German Silver | 50&10 |
| No. 50 Nickel Silver | 50&10 |
| No. 49 Nickel Silver | 50&10 |
| Wm. Rogers Mfg. Co. | 50&10 |
| Rogers' Silver Metal | 50&10 |
| 18% Rogers' German Silver | 50&10 |
| 22% Rogers' Nickel Silver | 50&10 |
| Rogers & Hamilton | 40&10 |
| Steel Goods | 40&15 |
| Cimeter, Flat | 40&15 |
| Cimeter, Steel Goods | 40&10 |
| Crown Hamilton, Flatware and Cutlery | 30 |
| German Silver | 50&10 |
| Nickel Silver | 50&10 |
| Britannia | 50&10 |
| Boardman's Nickel Silver, list July 1, 1891 | 50&10 |
| Boardman's Britannia Spoons, case lots | 50&10 |

Spring**Door**

| | |
|----------------------------------|-------|
| Torrey's Rod, 39 in. | 50 |
| Warner's No. 1, 40 in. | 50 |
| Gem (Coll), list April 19, 1886 | 20 |
| Star (Coll), list April 19, 1886 | 20&10 |
| Victor (Coll) | 50&10 |
| Champion (Coll) | 50&10 |
| Cowell's, No. 1, 40 in. | 50 |
| Rubber compound | 50&10 |
| Hercules | 50&10 |
| Phoenix | 50 |

Carriage, Wagon, &c.

| | |
|---|-------|
| Elliptic, Concord, Platform and Half Scroll | 50&10 |
| Chf. Bolster Springs | 25 |

Squares

| | |
|---------------------------------------|-------|
| Steel and Iron | 80&10 |
| Nickel Plated | 80&10 |
| Try Square and T Bevels | 50 |
| Disston's Try Square and T Bevels | 50 |
| Winterbottom's Try and Miter | 50 |
| Starrett's Micrometer Caliper Squares | 50 |
| Avery's Flush Bevel Squares | 40 |
| Avery's Bevel Protractor | 50 |

Squeezers**Fodder**

| | |
|------------------|----|
| Blair's | 50 |
| Blair's "Climax" | 50 |

Lemon

| | |
|------------------------|----|
| Porcelain Lined, No. 1 | 50 |
|------------------------|----|

Wood, No. 2

| | |
|------------------------------|----|
| Wood, Common | 50 |
| Dunlap's Improved | 50 |
| Sammis, No. 1, 50; No. 2, 50 | 50 |
| Jennings' Star | 50 |
| The Boss | 50 |
| Dean's, No. 1, 40; No. 2, 40 | 50 |
| Little Giant | 50 |
| King | 50 |
| Hotchkiss Straight Flash | 50 |
| Silver & Co. Glass | 50 |

Standard Fiber WareSee *Ware, Standard Fiber*.**Staples**

| | |
|----------------------------------|----|
| Barbed Blind, 1/2 in. and larger | 50 |
| Barbed Blind, 1/2 in. | 50 |
| Fence Staples, Galvanized | 50 |
| Fence Staples, Plain | 50 |
| Grand Crossing Tack Co.'s list | 50 |

Steel Yards**Smiths and Dies**

| | |
|--------------------------|----|
| Waterford Goods | 50 |
| Butterfield's Goods | 50 |
| Lightning Screw Plate | 50 |
| Reece's New Screw Plates | 50 |
| Reversible Ratchet | 50 |
| Gardner | 50 |
| Green River | 50 |

Steps Bench

| | |
|---------------------------------------|----|
| Morrill's, No. 1, 10.00; No. 2, 11.00 | 50 |
| Hotchkiss | 50 |
| Weston's, No. 1, 10.00; No. 2, 11.00 | 50 |

McGill's, No. 1 and 2, 50

| | |
|---------------------------|----|
| McGill's, No. 1 and 2, 50 | 50 |
| McGill's, No. 1 and 2, 50 | 50 |
| McGill's, No. 1 and 2, 50 | 50 |

Stone**Stones, Grind-See Grindstones****Scythe Stones**

| | |
|-------------------------------------|----|
| Pike Mfg. Co., list April, 1892 | 35 |
| Cleveland Stone Co., list Nov. 1892 | 35 |

Oil Stones, &c.

| | |
|------------------------------------|----|
| Pike Mfg. Co. | 50 |
| Hindustan No. 1, 40 | 50 |
| Sand Stone | 50 |
| Turkey Oil Stone, 4 to 8 in. | 50 |
| Turkey Slips | 50 |
| Lily White Washita | 50 |
| Rosy Red Washita | 50 |
| Washita Stone, Extra | 50 |
| Washita Stone, No. 1 | 50 |
| Washita Stone, No. 2 | 50 |
| Lily White Slips | 50 |
| Rosy Red Slips | 50 |
| Washita Slips, Extra | 50 |
| Washita Slips, No. 1 | 50 |
| Arkansas Stone, No. 1, 3 to 5 in. | 50 |
| Arkansas Stone, No. 1 1/2 to 2 in. | 50 |

Stove Polish**Stretchers Carpet**

| | |
|-------------------------|----|
| Cast Steel, Polished | 50 |
| Cast Iron, Steel Points | 50 |
| Socket | 50 |
| Butler's | 50 |

Strops Razor

| | |
|--|----|
| Genuine Emerson | 50 |
| Imitation | 50 |
| Torrey's | 50 |
| Badger's Belt and Com. | 50 |
| Lamont Combination | 50 |
| Jordan's Pat. Padded, list Nov. 1, 189, 50 | 50 |
| Electric Cutlery Co. | 50 |
| Campbell Cutlery Co. | 50 |

Stuffer, Sausage

| | |
|---|----|
| Miles' Challenge | 50 |
| Perry | 50 |
| Draw Cut No. 4, each \$30.00 | 50 |
| Enterprise Mfg. Co., list Jan 17, '93, 25 | 50 |

Sweepers, Carpet and Lawn**Carpet**

| | |
|--|----|
| Bissell No. 5 | 50 |
| Bissell No. 8 | 50 |
| Bissell, Grand | 50 |
| Standard | 50 |
| Domestic | 50 |
| Domestic, No. 2 | 50 |
| Grand Rapids | 50 |
| Crown Jewel, No. 1 | 50 |
| Crown Jewel, No. 2 | 50 |
| Improved Parlor Queen | 50 |
| Nickel | 50 |
| Japanned | 50 |
| Garland | 50 |
| Parlor Queen | 50 |
| Housewife's Delight | 50 |
| Ladies' Friend | 50 |
| Ladies' Friend No. 2 | 50 |
| Advance | 50 |
| Our Leader | 50 |
| Triumph | 50 |
| Supreme | 50 |
| Easy, Jap'd, No. 1, 50; Nickel, 50 | 50 |
| Gilt Edge | 50 |
| Acme | 50 |
| Imperial | 50 |
| Grand Republic | 50 |
| Jap'd, No. 1, 50; Nickel, 50 | 50 |
| Banner | 50 |
| Jap'd, No. 1, 50; Nickel, 50 | 50 |
| The Star | 50 |
| Reliable | 50 |
| Rapid Jap'd, No. 1, 50; Nickel, 50 | 50 |
| Our Own | 50 |
| Model | 50 |
| Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates: | 50 |
| 5 dozen in 6 months | 50 |
| 10 dozen in 6 months | 50 |
| Exception L.F. when 10 dozen price is \$13.50, and 25 dozen \$18.00 | 50 |

Lawn**Swings**

| | |
|-------------|----|
| Davies Lawn | 50 |
|-------------|----|

Tacks, Brads &c.

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks

| | |
|-------------------------------|----|
| American, Blue | 50 |
| American, Tin'd and Copp'd | 50 |
| Steel, Bright and Blue | 50 |
| Steel, Tinned and Coppered | 50 |
| Swedes Iron, Blue | 50 |
| Swedes Iron, Tinned | 50 |
| American Iron Tacks, Domestic | 50 |
| Swedes Iron Tacks | 50 |
| S. S., Blue | 50 |
| S. S., Tinned | 50 |
| Lanc., Blue | 50 |
| Lanc., Tinned | 50 |
| Gimp and Lace Tacks | 50 |
| S. S., Blue | 50 |
| S. S., Tinned | 50 |
| Lanc., Blue | 50 |
| Lanc., Tinned | 50 |
| Basket and Trimmers' Tacks | 50 |
| Lanc. | 50 |
| S. S. | 50 |
| Hungarian Nails | 50 |
| Common and Patent Brads | 50 |
| Leathered Tacks | 50 |
| Brush Tacks, S. S. | 50 |
| Looking Glass Tacks, S. S. | 50 |
| Picture Frame Points, S. S. | 50 |
| Finishing Nails | 50 |
| Trunk and Clout Nails | 50 |
| Black | 50 |
| Tinned or Coppered | 50 |
| Basket Nails | 50 |
| Chair Nails | 50 |
| Clag Box Nails | 50 |
| Tin Capped Nails | 50 |

Miscellaneous

| | |
|--------------------|----|
| Double Point | 50 |
| Wire Carpet Nails | 50 |
| Claw Handle Carpet | 50 |
| Bonnie Blue | 50 |

Bill Nye Brad Box

| | |
|------------------------------|----|
| Parisian Gilt Nails, cartoon | 50 |
|------------------------------|----|

Home Tacks, No. 50

| | |
|--------------------|----|
| Home Tacks, No. 50 | 50 |
|--------------------|----|

Home Nails, No. 200

| | |
|---------------------|----|
| Home Nails, No. 200 | 50 |
|---------------------|----|

Upholsterers' Nails

| | |
|---------------------|----|
| Upholsterers' Nails | 50 |
|---------------------|----|

Wire Brads and Nails

| | |
|---|----|
| Steel Wire Brads, R. & E. Mfg. Co.'s list | 50 |
|---|----|

Tanks, Oil

| | |
|---|----|
| Emerald, S. S. & Co.: 80-gal. \$8.75; 40-gal. \$11 each | 50 |
|---|----|

Tapes, Measuring

| | |
|----------------------------|----|
| Excelsior, Special list | 50 |
| Spring | 50 |
| Chesterman's, Regular list | 50 |

Thermometers

| | |
|----------|----|
| Tin Case | 50 |
|----------|----|

Thimble Skins-See Skins**Ties, Bale-Steel**

| | |
|---------------------|----|
| Standard Wire, list | 50 |
|---------------------|----|

Tinners' Shears, &cSee *Shears, Tinners' &c.***Tinware**

| | |
|---|----|
| Stamped, Japanned and Plated, list Jan 20, 1887 | 50 |
|---|----|

Tire Benders, Upsetters, &c.See *Benders and Upsetters, Tire*.**Tobacco Cutters**See *Cutters, Tobacco*.**Tools****Coopers**

| | |
|----------------------------|----|
| Bradley's | 50 |
| L. & J. White | 50 |
| Alberston Mfg. Co. | 50 |
| Boat's | 50 |
| Sandusky Tool Co. | 50 |
| Shaves Cincinnati Tool Co. | 50 |

Lumber

| | |
|--|----|
| Ring Peavies, "Blue Line" | 50 |
| Ring Peavies, Common | 50 |
| Steel Socket Peavies | 50 |
| Mail, Iron Socket Peavies | 50 |
| Cant Hooks, "Blue Line" | 50 |
| Cant Hooks, Common Finish | 50 |
| Cant Hooks, Mail Socket Clasp, "Blue Line" | 50 |
| Cant Hooks, Mail Socket Clasp, Common Finish | 50 |
| Cant Hooks, Clip Clasp, "Blue Line" | 50 |
| Cant Hooks, Clip Clasp, Common Finish | 50 |
| Hand Spikes | 50 |

Pike Poles, Pike & Hook

| | |
|-------------------------|----|
| Pike Poles, Pike & Hook | 50 |
|-------------------------|----|

Pike Poles, Pike only

| | |
|-----------------------|----|
| Pike Poles, Pike only | 50 |
|-----------------------|----|

Pike Poles, not ironed

| | |
|------------------------|----|
| Pike Poles, not ironed | 50 |
|------------------------|----|

Setting Poles

| | |
|---------------|----|
| Setting Poles | 50 |
|---------------|----|

Swamp Hooks

| | |
|-------------|----|
| Swamp Hooks | 50 |
|-------------|----|

Saw

| | |
|-------------------|----|
| Atkins', new list | 50 |
| Simonds' | 50 |

Transom LiftersSee *Lifters, Transom*.**Traps****Game**

| | |
|----------------------|----|
| Newhouse | 50 |
| Oneida Pattern | 50 |
| Game, Blake's Patent | 50 |

Mouse and Rat

| | |
|--|----|
| Mouse Wood, Choker | 50 |
| Mouse, Round Wire | 50 |
| Mouse, Cage, Wire | 50 |
| Mouse, Catch-em-alive | 50 |
| Mouse, Bonanza | 50 |
| Rat, Decoy | 50 |
| Ideal | 50 |
| Cyclone | 50 |
| Hotchkiss Metallic Mouse, 5-hole traps | 50 |
| Hotchkiss Imp. Rat Killer | 50 |
| Hotchkiss New Rat Killer | 50 |
| Schuyler's Rat Killer | 50 |
| Dandy | 50 |
| Wadde's Go Bang | 50 |

Fly

| | |
|-----------------------------|----|
| Harper, Champion or Paragon | 50 |
|-----------------------------|----|

Ballon, Globe or Acme

| | |
|-----------------------|----|
| Ballon, Globe or Acme | 50 |
|-----------------------|----|

Triers

| | |
|-------------------|----|
| Butter and Cheese | 50 |
|-------------------|----|

Trimmers, Spoke

| | |
|---------------------------------------|----|
| Bonney's | 50 |
| Stearns' | 50 |
| Ives', No. 1, \$15.00; No. 2, \$12.00 | 50 |
| Douglas' | 50 |
| Cincinnati | 50 |

Trowels

| | |
|------------------------------------|----|
| Lothrop's Brick and Plastering | 50 |
| Reed's Brick and Plastering | 50 |
| Disston's Br'k and Plastering | 50 |
| Peace's Plastering | 50 |
| Clement & Maynard's | 50 |
| Brad's Brick | 50 |
| Worrall's Brick and Plastering | 50 |
| Garden | 50 |
| Cleves' Angle Trowel | 50 |
| No. 2, \$30; No. 3, \$15. net @ 10 | 50 |

Trucks, Warehouse, &c.

| | |
|--------------------------------------|----|
| B. & L. Block Co.'s list | 50 |
| Thompson Mfg. Co. | 50 |
| Barnes' Barrel Trucks | 50 |
| Daisy Stove Trucks, Improved pattern | 50 |

Tubes RollerSee *Pipe*.

Whips

| American Whip Co.: Length. | 4½ | 5 | 5½ | 6 | 6½ | 7 | 7½ | 8 ft. |
|---|---------|-------|-------|-------|-------|-------|-------|-------|
| X. L. Whalebone Driving..... | \$18.00 | 20.00 | 22.00 | 24.00 | 27.00 | 30.00 | 33.00 | 36.00 |
| Eureka, Two-thirds Whalebone..... | 15.00 | 16.50 | 18.00 | 20.00 | | | | |
| Bull Bone, Half-length Whalebone..... | | | 11.00 | 12.00 | 13.00 | 15.00 | 16.50 | |
| American Standard..... | 8.00 | 8.50 | 9.50 | 10.50 | 12.00 | 13.50 | 15.00 | 16.50 |
| True Grip, Raw Hide Center..... | 6.00 | 6.00 | 6.50 | 7.00 | 7.50 | 8.00 | | |
| New Name, Stoked Java, Black and White Colors..... | | | | 6.00 | | | | |
| Americus, 93 Pen Whip..... | | | | 6.00 | | | | |
| Gents' Light Driving No. 111..... | | | | 6.00 | | | | |
| Gents' Light Driving No. 106..... | | | | 5.00 | | | | |
| Hand-made Stoked Java No. 103..... | | | 3.75 | 4.00 | | | | |
| A large variety of cheaper grades..... | | | | | | | | |
| Team Whips..... | | | | | | | | |
| Toy Whips..... | | | | | | | | |
| Hardware Assortment, 10/American, 75 Whips for \$50.00. | | | | | | | | |

Wire and Wire Goods—Iron—

| Market, | Br. & Ann., Nos. 0 to 18. | Extra 5@10% often given and low net prices often made on large lots. |
|---------|---|--|
| | 75¢@75¢10¢55¢ | |
| | Cop'd, Nos. 0 to 18, 75¢55¢ | |
| | Galv., Nos. 0 to 18, 70¢55¢@70¢10¢ | |
| | Tin'd, Tin'd list, Nos. 0 to 18, 70¢@70¢10¢ | |

| | |
|--|------------------|
| Ossawan Mills, Brass and Copper on Spools..... | 50¢10% |
| Tate's Spooled, Tin'd & Annealed..... | 60¢55¢ |
| Tate's Spooled Cop. and Brass..... | 50¢ |
| Cast Steel Wire..... | 50¢ |
| Stub's Steel Wire..... | \$6.00 to \$2.30 |
| Steel Music Wire, 12 to 30, imported..... | 60¢@70¢ |
| Wire Clothes Line, see Lines. | |
| Wire Picture Cord, see Cord. | |

Bright Wire Goods—Wire Cloth and Netting—

| | |
|---|--------------|
| Standard list..... | 35¢10¢10¢90¢ |
| Painted Screen Cloth 100 ft \$1.45 \$1.50 | |
| Galvanized Wire Netting..... | 75¢10¢30% |

Wire Barb—

See Trade Report.

Wire Rope—See Ropes, Wire.

Wrenches—

| | |
|------------------------------------|-----------|
| American Adjustable..... | 40% |
| Baxter's Adjustable "S"..... | 40¢10¢50% |
| Baxter's Diagonal..... | 60% |
| Coe's Genuine..... | 50¢50¢10% |
| Coe's "Mechanics"..... | 50¢10¢3% |
| Grand Standard..... | 55¢10¢70% |
| Lamson & Sessions' Engineers'..... | 60¢10% |
| Lamson & Sessions' Standard..... | 70¢10% |
| P. S. & W. Agricultural..... | |
| Grand Agricultural..... | 75¢10¢80% |
| Lamson & Sessions' Agric'l..... | |
| W. & B. Diamond..... | |

| | |
|---------------------------------|----------------|
| Bemis & Call's: | |
| Pat. Combination Bright..... | 40¢55¢ |
| Pat. Combination Black..... | 40¢10% |
| Merrick's Pattern..... | 30¢10% |
| Briggs' Pattern..... | 30¢10% |
| Cylinder or Gas Pipe..... | 45¢55¢ |
| No. 3 Pipe..... | 55¢ |
| Aiken's Pocket (Bright)..... | \$8.00, 50¢10% |
| The Favorite Pocket..... | \$4.00, 40% |
| Webster's Pat. Combination..... | 30% |
| Boardman's..... | 25¢55¢ |
| Always Ready..... | 50% |
| Alligator..... | 20¢10% |
| Donohue's Engineer..... | 50¢10% |
| Eagle..... | 50¢10% |
| Acme, Bright..... | 50¢10% |
| Acme, Nickle..... | 70¢70¢55¢ |
| Herules..... | 55¢3% |
| Walker's..... | 55¢3% |
| Diamond Steel..... | 55¢3% |
| Cincinnati Brace Wrenches..... | 25¢10% |
| Taft's Vice Wrench..... | 55¢10¢3% |

Wringers, Clothes—

| | |
|---|---------|
| Am. Wringer Co.'s list, July 1, 1893..... | 2% cash |
| Colby Wringer Co., list Sept. 1..... | 2% cash |
| Lowe's Mfg. Co., list July 1, 1892..... | 2% cash |
| Peerless Mfg. Co., list Feb. 1892..... | 2% cash |
| National Wringer & Mfg. Co., list June 1, 1892..... | 2% cash |

Wrought Goods—

| | |
|--|--------------|
| Staples, Hooks, &c., list, March 17, 1892..... | 85¢10¢85¢15¢ |
|--|--------------|

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

| | |
|---|----|
| Linseed, City, raw, per gal..... | 47 |
| Linseed, City, boiled..... | 47 |
| Linseed, Western, raw..... | 47 |
| Lard, City, Extra Winter..... | 70 |
| Lard, City, Prime..... | 70 |
| Lard, City, Extra No. 1..... | 50 |
| Lard, City, No. 1..... | 45 |
| Lard, Western, prime..... | 70 |
| Cotton-seed, Crude, prime..... | 23 |
| Cotton-seed, Crude, off grades..... | 25 |
| Cotton-seed, Summer Yellow, prime..... | 36 |
| Cotton-seed, Summer Yellow, off grades..... | 34 |
| Sperm, Crude..... | 65 |
| Sperm, Natural Spring..... | 66 |
| Sperm, Bleached Spring..... | 71 |
| Sperm, Natural Winter..... | 71 |
| Sperm, Bleached Winter..... | 76 |
| Whale, Crude..... | 45 |
| Whale, Natural Winter..... | 45 |
| Whale, Bleached Winter..... | 48 |
| Whale, Extra Bleached..... | 50 |
| Sea Elephant, Bleached Winter..... | 32 |
| Menhaden, Crude, Sound..... | 38 |
| Menhaden, Crude, Southern..... | 38 |
| Menhaden, Light Pressed..... | 41 |
| Menhaden, Bleached W'ter..... | 43 |
| Menhaden, Extra Bleached..... | 43 |
| Tallow, Western, prime..... | 54 |
| Cocconut, Ceylon..... | 64 |
| Cod, Domestic..... | 38 |
| Cod, Foreign..... | 42 |
| Red Elaine..... | 35 |
| Red Saponified..... | 5 |
| Bank..... | 38 |
| Straits..... | 39 |
| Olive, Italian, bbls..... | 68 |
| Neatsfoot, prime..... | 60 |
| Palm, prime, Lagos..... | 54 |

Mineral Oils—

| | |
|---|---------|
| Black, 29 gravity, 25 @ 30 cold test..... | 7 @ 74 |
| Black, 29 gravity, 15 cold test..... | 74 @ 8 |
| Black, 29 gravity, summer..... | 6 @ 64 |
| Cylinder oil, filtered..... | 14 @ 16 |

| | |
|----------------------------------|----------|
| Cylinder, dark, filtered..... | 10 @ 13 |
| Paraffine, 23½ @ 24 gravity..... | 11 @ 12 |
| Paraffine, 25 gravity..... | 10 @ 11 |
| Paraffine, 28 gravity..... | 74 @ 8 |
| Paraffine, red..... | 94 @ 104 |

Paints and Colors—

| | |
|---|-----------------|
| Barytes, Foreign, 1 ton..... | \$22.00 @ 24.00 |
| Barytes, Amer. floated..... | 23.00 @ 25.00 |
| Barytes, Amer. No. 1..... | 16.00 @ 18.00 |
| Barytes, Amer. No. 2..... | 13.00 @ 15.00 |
| Barytes, Amer. No. 3..... | 11.00 @ 12.00 |
| Blue, Celestial..... | 8 @ 8 |
| Blue, Chinese..... | 40 @ 50 |
| Blue, Prussian..... | 25 @ 40 |
| Blue, Ultramarine..... | 8 @ 25 |
| Brown, Spanish..... | 1 @ 1 |
| Brown, Vandyke, Amer..... | 3 @ 34 |
| Brown, Vandyke, English..... | 6 @ 8 |
| Carmine, No. 40, in bulk..... | 2.75 @ |
| Carmine, No. 40, in boxes or barrels..... | 2.85 @ |
| Carmine, No. 40, in ounce bottles..... | 3.75 @ |
| Chalk, in bulk..... | 1.75 @ 2.00 |
| Chalk, in bbls. 100 lb..... | 33 @ 40 |
| China Clay, English..... | 13.00 @ 18.00 |
| Cobalt Oxide, prep'd..... | 9.00 @ 11.00 |
| Cobalt Oxide, black..... | 1.90 @ |
| less 100 lb..... | 1.90 @ |
| Green, Paris, in bulk..... | 10 @ 104 |
| Green, Paris, 170 @ 175 lb..... | 104 @ 11 |
| Green, Paris, small pack..... | 12 @ 17 |
| Green, Chrome, ordinary..... | 6 @ 12 |
| Green, Chrome, pure..... | 22 @ 25 |
| Lead, Eng., B.B. white..... | 7 @ 8 |
| Lead, Ann. White, dry or in kegs, lots less than 500 lb..... | 6 @ 64 |
| Kegs, lots 500 lb to 5 tons..... | 6 @ 64 |
| Kegs, lots 5 tons to 12 tons..... | 5 @ 54 |
| Kegs, lots 12 tons and over..... | 5 @ 54 |
| Lead, White, in oil, 25 lb tin pails, add to keg price..... | 1 @ 14 |
| Lead, White, in oil, 12½ lb tin pails, add to keg price..... | 1 @ 14 |
| Lead, White, in oil, 1 to 6 lb assorted tins, add to keg price..... | 2 @ 24 |
| Lead, Red, bbls. and ½ bbls..... | 54 @ 64 |
| Lead, Red, kegs..... | 54 @ 64 |
| Litharge, kegs..... | 54 @ 64 |
| Litharge, bbls. and ½ bbls..... | 54 @ 64 |

| | |
|---|-------------|
| TERMS, &c.—Lead and Litharge.—On lots of 500 lb or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice. | |
| Ocher, Rochelle..... | 1.35 @ 14 |
| Ocher, French Washed..... | 14 @ 24 |
| Ocher, German Washed..... | 14 @ 3 |
| Ocher, American..... | 84 @ 14 |
| Orange Mineral, English..... | 10 @ 104 |
| Orange Mineral, French..... | 84 @ 9 |
| Orange Mineral, German..... | 84 @ 84 |
| Orange Mineral, American..... | 84 @ 84 |
| Paris White, English Cliff-stone..... | 1.00 @ 1.15 |
| Paris White, American..... | 65 @ 75 |
| Red, Indian, English..... | 54 @ 7 |
| Red, Indian, American..... | 2 @ 64 |
| Red, Turkey..... | 9 @ 14 |
| Red, Tuscan..... | 9 @ 11 |
| Red, Venetian, American..... | 1.00 @ 1.10 |
| Red, Venetian, English..... | 1.20 @ 1.35 |

| | |
|--|-----------|
| Sienna, Italian, Burnt and Powder..... | 4 @ 5 |
| Sienna, Ital., Burnt Lumps..... | 14 @ 34 |
| Sienna, Ital., Raw, Powder..... | 44 @ 54 |
| Sienna, Ital., Raw, Lumps..... | 14 @ 34 |
| Sienna, American, Raw..... | 14 @ 14 |
| Sienna, American, Burnt..... | 14 @ 14 |
| Powdered..... | 14 @ 14 |
| Talc, French..... | 14 @ 14 |
| Talc, American..... | 14 @ 14 |
| Terra Alba, Frch. 100 lb..... | 95 @ 1.25 |
| Terra Alba, English..... | 70 @ 80 |
| Terra Alba, American No. 1..... | 65 @ 75 |
| Terra Alba, American No. 2..... | 45 @ 50 |
| Umber, Turkey, Burnt and Powdered..... | 34 @ 4 |
| Umber, Turkey, Bnt. Ln..... | 24 @ 3 |
| Umber, Turkey, Raw and Powdered..... | 34 @ |
| Umber, Turkey, Bnt. Amer..... | 24 @ 14 |
| Umber, Turkey, R'w Amer..... | 14 @ 14 |
| Yellow, Chrome..... | 10 @ 25 |
| Vermilion, American Lead..... | 11 @ 12 |
| Vermilion, Quicks'ers, bulk..... | 43 @ |
| Vermilion, Quicks'ers, bags..... | 44 @ |
| Vermilion, Quicksilver sm'r pks..... | 52 @ |
| Vermilion, English Import..... | 80 @ 55 |
| Vermilion, Imitation, Eng..... | 8 @ 30 |
| Vermilion, Trieste..... | 90 @ 924 |
| Vermilion, Chinese..... | 924 @ 95 |
| Whiting Common, 100 lb..... | 374 @ 424 |
| Whiting Gliders..... | 45 @ 55 |

| | |
|--|-----------|
| Zinc, American, dry..... | 34 @ 44 |
| Zinc, French, Red Seal..... | 74 @ |
| Zinc, French, Green Seal..... | 9 @ |
| Zinc, French, V. M. X..... | 7 @ |
| Zinc, Antwerp, Red Seal..... | 74 @ |
| Zinc, Antwerp, Green Seal..... | 74 @ |
| Zinc, German, L. Z. O..... | 64 @ 74 |
| Zinc, V. M. in Poppy Oil..... | |
| Seal, lots of 1 ton and over..... | 104 @ 114 |
| lots less than one ton..... | 11 @ 114 |
| Zinc, V. M. in Poppy Oil, Red Seal..... | 10 @ 104 |
| lots of 1 ton and over..... | 10 @ 104 |
| lots less than 1 ton..... | 10 @ 104 |
| Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 14; 25 bbls, 24; 50 bbls. 4%. No discount allowed on less than bbl. lots. | |

Colors in Oil—

| | |
|-------------------------------|----------|
| Black, Drop, Frankfurt..... | 25 @ 30 |
| Black, Drop, English..... | 12 @ 15 |
| Black, Drop, Domestic..... | 7 @ 10 |
| Black, Lampblack, Best..... | 20 @ 35 |
| Black, Lampblack, Common..... | 7 @ 13 |
| Black, Ivory..... | 8 @ 15 |
| Blue, Chinese..... | 35 @ 40 |
| Blue, Prussian..... | 20 @ 45 |
| Blue, Ultramarine..... | 12 @ 18 |
| Brown, Vandyke..... | 7 @ 12 |
| Green, Chrome..... | 8 @ 13 |
| Green, Paris..... | 16 @ 184 |
| Sienna, Raw..... | 7 @ 14 |
| Sienna, Burnt..... | 7 @ 14 |
| Umber, Raw..... | 7 @ 10 |
| Umber, Burnt..... | 7 @ 10 |

Putty—

| | |
|----------------------------|---------------|
| In barrels and ½ bbls..... | .013¢ @ .018¢ |
| In tubs..... | .018¢ @ .018¢ |
| In tin cans..... | .018¢ @ .024¢ |
| In bladders..... | .018¢ @ .024¢ |

Spirits Turpentine—

| | |
|----------------------|-------|
| In regular bbls..... | @ 304 |
| In machine bbls..... | @ 31 |

Glue—

| | |
|-------------------|---------|
| Low Grade..... | 8 @ 10 |
| Cabinet..... | 12 @ 14 |
| Medium White..... | 13 @ 15 |
| Extra White..... | 17 @ 20 |
| French..... | 10 @ 22 |
| English..... | 10 @ 15 |
| Irish..... | 12 @ |

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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BRITISH AGENCY: Office of The Ironmonger, 42 Cannon St., London.

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth St.; Sydney, 234 Clarence St.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.

New dealers or booksellers in any part of the world may obtain The Iron Age through The American News Company, New York, U. S. A. The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-Class Matter.

CURRENT METAL PRICES.

JANUARY 17, 1894.

*The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

| | |
|----------------------------------|--------------------|
| Common Iron: | |
| 1 to 2 in. round and square... | 1/2 lb 1.80 @ 1.90 |
| 1 to 6 in. x 1/2 to 1 in. | |
| Refined Iron: | |
| 1/2 to 2 in. round and square... | 1/2 lb 1.90 @ 2.00 |
| 1 to 4 in. x 1/2 to 1 1/2 in. | |
| 4 1/2 to 6 in. x 1/2 to 1 in. | |
| 1 to 6 in. x 1/2 and 5-18. | 1/2 lb 2.10 @ 2.20 |
| Rods—1/2 and 1-18 round and sq. | 1/2 lb 2.00 @ 2.10 |
| Bands—1 to 6 x 3-18 to No. 12. | 1/2 lb 2.20 @ 2.30 |
| "Burden Best" Iron, base price. | 1/2 lb 3.00 |
| Burden's "H. B. & S." Iron, | |
| base price..... | 1/2 lb 2.80 |
| "Ulster"..... | 1/2 lb 3.00 |
| Norway Bars..... | 3.75 @ 4.00 |
| Norway Shapes..... | 4.50 @ 5.00 |

Merchant Steel from Store—

| | |
|--|-------|
| Open-Hearth and Bessemer Machinery, | |
| Toe Calk, Tire and Sleigh Shoe, base | |
| price in small lots..... | 2 1/2 |
| Best Cast Steel, base price in small lots. | 8 |
| Best Cast Steel Machinery, base price in | |
| small lots..... | 5 |

Sheet Iron from Store—

Black—

| | |
|---------------------------------|---------------|
| Nos. 14 to 20..... | 3 @ 3 1/4 |
| 21 to 24..... | 3 1/4 @ 3 3/4 |
| 25 to 28..... | 3 3/4 @ 3 1/2 |
| 27..... | 3 1/2 @ 3 3/4 |
| 28..... | 3 3/4 @ 3 1/2 |
| Common 1/4 less than the above. | |

Open Hearth Steel.

| | |
|--|---------------|
| Best Soft Steel, Nos. 14 to 18..... | 2 1/4 @ 2 3/4 |
| " " " " 18 to 20..... | 2 3/4 @ 3 |
| " " " " 21 to 24..... | 3 1/4 @ 3 1/2 |
| " " " " 25 to 28..... | 3 3/4 @ 3 1/2 |
| " " " " 27 to 28..... | 3 3/4 @ 3 1/2 |
| Best Bloom Sheets, 1/4 extra over above prices. | |
| Best Bloom, Galvanized, jobbing dis. 70 @ 70 1/2 | |
| Ordinary Bessemer, 1/4 @ 1/4 lower than | |
| above prices. | |

Russia, Planished, &c.

| | |
|---------------------------------|------------------------|
| Genuine Russia, according to | |
| assortment..... | 1/2 lb 12 @ 13 |
| Patent Planished..... | 1/2 lb A, 10 @ B, 9, 5 |
| Craig Polished Sheet Steel..... | 1/2 lb, 8 1/2 |

Foreign Steel from Store—

| | |
|------------------------------------|---------------|
| Best Cast..... | 1/2 lb 15 |
| Extra Cast..... | 1/2 lb 18 1/2 |
| Swaged Cast..... | 1/2 lb 18 |
| Best Double Shear..... | 1/2 lb 15 |
| Blister, 1st quality..... | 1/2 lb 12 |
| German Steel, Best..... | 1/2 lb 10 |
| 2d quality..... | 1/2 lb 9 |
| 3d quality..... | 1/2 lb 8 |
| Sheet Cast Steel, 1st quality..... | 1/2 lb 15 |
| 2d quality..... | 1/2 lb 14 |
| 3d quality..... | 1/2 lb 12 1/2 |
| R. Mushet's "Special"..... | 1/2 lb 75 |
| " " " " Annealed..... | 1/2 lb 20 |
| " " " " "Titanic"..... | 1/2 lb 20 |
| Eicken's Special No. 8..... | 1/2 lb 30 |
| Extra..... | 1/2 lb 15 |

METALS—

Tin—

| | |
|----------------------|-----------------|
| Banca, Pigs..... | 22 1/2 @ 22 1/2 |
| Straits, Pigs..... | 21 1/4 @ 22 |
| Straits in Bars..... | 22 1/2 @ 23 |

Tin Plates—

Duty: 2 1/2 % lb.

Charcoal Plates—Bright—

| | |
|---|------------|
| Guaranteed Plates command special prices, | |
| according to quality..... | |
| Melyn and Calland Grade, IC, 10 x 14..... | 10 @ 6.50 |
| " " " " IC, 12 x 12..... | 12 @ 6.75 |
| " " " " IC, 14 x 20..... | 14 @ 6.50 |
| " " " " IC, 20 x 28..... | 20 @ 12.00 |
| " " " " IC, 10 x 14..... | 10 @ 6.50 |
| " " " " IC, 12 x 12..... | 12 @ 6.75 |
| " " " " IC, 14 x 20..... | 14 @ 6.50 |
| " " " " IC, 20 x 28..... | 20 @ 12.00 |
| " " " " IC, 12 x 17..... | 12 @ 6.00 |
| " " " " IC, 14 x 20..... | 14 @ 6.50 |
| " " " " IC, 20 x 28..... | 20 @ 12.00 |
| Allaway Grade..... | 10 @ 6.00 |
| " " " " IC, 12 x 12..... | 12 @ 6.25 |
| " " " " IC, 14 x 20..... | 14 @ 6.00 |
| " " " " IC, 20 x 28..... | 20 @ 12.00 |
| " " " " IC, 12 x 13..... | 12 @ 7.25 |
| " " " " IC, 14 x 20..... | 14 @ 7.50 |
| " " " " IC, 20 x 28..... | 20 @ 12.00 |
| " " " " IC, 14 x 20..... | 14 @ 14.60 |
| " " " " IC, 20 x 28..... | 20 @ 14.60 |
| " " " " IC, 12 x 17..... | 12 @ 5.50 |
| " " " " IC, 14 x 20..... | 14 @ 6.75 |

Coke Plates—Bright—

| | |
|---------------------------------------|-----------------|
| Steel Coke.—IC, 10 x 14, 14 x 20..... | \$5.40 @ \$5.50 |
| " " " " 10 x 20..... | 8.25 @ |
| " " " " 20 x 28..... | 11.60 @ |
| " " " " IX, 10 x 14, 14 x 20..... | 6.5 @ |
| BV Grade.—IC, 10 x 14, 14 x 20..... | 6.50 @ |

Charcoal Plates—Terne—

| | |
|--|---------|
| Guaranteed Plates command special prices | |
| according to quality..... | |
| Dean Grade.—IC, 14 x 20..... | 5.65 @ |
| " " " " 20 x 28..... | 11.00 @ |
| " " " " IX, 14 x 20..... | 6.40 @ |
| " " " " 20 x 28..... | 12.80 @ |
| Abecarne Grade.—IC, 14 x 20..... | 5.55 @ |
| " " " " 20 x 28..... | 10.75 @ |
| " " " " IX, 14 x 20..... | 6.40 @ |
| " " " " 20 x 28..... | 12.80 @ |

Tin Boiler Plates—

| | | |
|--------------------------------|-----------------|-----------|
| IXX, 14 x 28..... | 112 sheets..... | \$13.35 @ |
| IXX, 14 x 28..... | 112 sheets..... | 14.50 @ |
| IXX, 14 x 31..... | 112 sheets..... | 18.00 @ |
| American Terne Plates.—Apollo. | | |
| IC, 14 x 20..... | | \$6.25 @ |
| IC, 20 x 28..... | | 12.50 @ |
| IX, 14 x 20..... | | 7.25 @ |
| IX, 20 x 28..... | | 14.50 @ |

Copper—

Duty: Pig, Bar and Ingot, 1 1/4 %; Old Copper, 1 % lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot—

| | |
|----------------------------|----------|
| Lake..... | @ 11 |
| Ansonia grade Arizona..... | @ 10 1/4 |
| Ansonia grade Casting..... | @ 10 |

Sheet and Bolt—

Prices adopted by the Association of Copper Manufacturers of the United States, May 19, 1892. Subject to a discount of 15 % @ 35 %, according to size of order. Stubs' gauge standard.

| | Not wider than | Not longer than | And longer than | Weights per sq. foot and prices per pound. | | | | | | | | | |
|------------------|----------------|-----------------|-----------------|--|--------------|--------------|--------------|--------------|--------------|-------------|-----------------|--|--|
| | | | | Over 64 oz. | 32 to 64 oz. | 16 to 32 oz. | 14 to 16 oz. | 12 to 14 oz. | 10 to 12 oz. | 8 to 10 oz. | Less than 8 oz. | | |
| 30 | 72 | | | 23 | 23 | 23 | 23 | 24 | 25 | 28 | 30 | | |
| 30 | | 72 | | 23 | 23 | 23 | 23 | 25 | 27 | 31 | | | |
| 36 | 96 | | | 23 | 23 | 23 | 23 | 26 | 28 | 33 | | | |
| 36 | | 96 | | 23 | 23 | 23 | 23 | 27 | 31 | 35 | | | |
| 48 | 96 | | | 23 | 23 | 23 | 23 | 28 | 32 | | | | |
| 48 | | 96 | | 23 | 23 | 23 | 23 | 27 | 29 | 33 | | | |
| 60 | 96 | | | 23 | 23 | 23 | 23 | 29 | 34 | | | | |
| 60 | | 96 | | 23 | 23 | 23 | 23 | | | | | | |
| 84 | 96 | | | 23 | 23 | 23 | 23 | | | | | | |
| 84 | | 96 | | 24 | 25 | | | | | | | | |
| Over 84 in. wide | | | | 25 | 27 | | | | | | | | |

Bolt Copper, 1/2 inch diameter and over, 1/2 lb 22 1/2
Circles, Segments and Pattern Sheets, 60 in. diameter and less, 3/4 lb advance over prices of Sheet Copper required to cut them from.
Circles, Segments and Pattern Sheets, over 60 in. diameter, up to 96 in. diameter inclusive, 1/2 lb advance over prices of Sheet Copper required to cut them from.
Circles, Segments and Pattern Sheets, over 96 in. diameter, 5/8 lb advance over prices of Sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. square foot and heavier, 1/2 lb over the foregoing prices.
Cold or Hard Rolled Copper lighter than 14 oz. square foot, 2/3 lb over the foregoing prices.
All Polished Copper over 20 in. wide, 2/3 lb advance over the foregoing prices.

Copper Bottoms, Pits and Flats—

| | |
|--|----|
| 14 ounce to square foot and heavier..... | 28 |
| 12 ounce and up to 14 ounce to square foot..... | 27 |
| 10 ounce and up to 12 ounce..... | 26 |
| Lighter than 10 ounce..... | 25 |
| Circles less than 8 inches diameter, 2 1/2 lb additional. | |
| Circles over 13 inches diameter are not classed as Copper Bottoms. | |
| 15 % @ 25 % discount, according to size of order. | |

Copper Wash Bowl Bottoms—

| | |
|-------------|--------------------|
| Tinned..... | 1/2 lb 34, 15 @ 25 |
|-------------|--------------------|

Tinning—

Net.

| | |
|---|-------|
| Tinning sheets on one side, 10, 12 and 14 x 48 each..... | 8 |
| Tinning sheets on one side, 30 x 60 each..... | 80 |
| For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each..... | 15 |
| For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each..... | 12 |
| For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each..... | 12 |
| Tinning sheets on one side, other sizes, per square foot..... | 2 1/4 |
| For tinning both sides double the above prices. | |

Planished Brass and Copper—

| | |
|--------------------------|-------------|
| Not larger than 30 x 60. | |
| 16 oz. and heavier..... | 24 1/2 @ 25 |
| 14 oz..... | 25 1/2 @ 26 |
| 12 oz..... | 27 1/2 @ 28 |

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.

| O. G. | N. G. | % | % | % | % | % | 1 | 1 1/2 |
|-------|-------|----|----|----|----|----|----|-------|
| 8-14 | 6-12 | 32 | 28 | 25 | 24 | 23 | 22 | 19 |
| 16 | 13 | 33 | 28 | 26 | 25 | 24 | 23 | 20 |
| 18 | 14 | 34 | 29 | 27 | 26 | 25 | 24 | 20 |
| 17 | 15 | 35 | 30 | 28 | 27 | 26 | 25 | 21 |
| 18 | 16 | 37 | 31 | 29 | 27 | 26 | 25 | 22 |
| 19 | 17 | 38 | 32 | 30 | 29 | 28 | 27 | 24 |
| 20 | 18-19 | 39 | 34 | 32 | 31 | 30 | 29 | 26 |
| 21 | 20 | 41 | 36 | 34 | 33 | 32 | 31 | 29 |
| 22 | 21 | 43 | 37 | 36 | 34 | 33 | 32 | 31 |
| 23 | 22 | 45 | 39 | 37 | 36 | 35 | 34 | 34 |
| 24 | 23 | 48 | 41 | 39 | 38 | 36 | 35 | 36 |
| 25 | 24 | 51 | 44 | 41 | 40 | 39 | 38 | 40 |

Copper, Bronze and Gliding Tube, 3/4 lb additional
Braided Brass Tubing. (To No. 20 inclusive.)
Brown & Sharpe's gauge standard.

| | |
|--|------|
| Above 5-18 inch to 3 inch, inclusive..... | 35 |
| Plain, above 3 inch..... | 45 |
| Plain, 5-18 inch..... | 46 |
| Plain, 1/4 inch..... | 60 |
| Plain, 3-16 inch..... | 1.00 |
| Plain, 1/8 inch..... | 1.50 |
| Pancy Tubing, Brass, to No. 20, inclusive..... | 43 |
| Bronze Tubing, 3/4 lb more than Brass. | |
| Discount from list..... | 30 @ |

Roll and Sheet Brass—

(Brown & Sharpe Standard Gauge.)

| | Wider than | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
|-----------------------------|------------|--------|--------|--------|--------|--------|--------|--------|----|
| | | | | | | | | | |
| Common High Brass: | | | | | | | | | |
| Wider than | 2 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| and including | | | | | | | | | |
| Te No. 20, inclusive..... | 21 | 22 | 23 | 24 | 25 | 27 | 29 | 31 | 33 |
| Nos. 21, 22, 23 and 24..... | 22 | 23 | 24 | 25 | 27 | 29 | 31 | 33 | 34 |
| Nos. 25 and 26..... | 22 1/2 | 23 1/2 | 24 1/2 | 25 1/2 | 27 1/2 | 29 1/2 | 31 1/2 | 33 1/2 | 35 |
| Nos. 27 and 28..... | 23 | 24 | 25 | 26 | 28 | 30 | 32 | 34 | 36 |

| Common High Brass: | in. 24 | in. 28 | in. 32 | in. 36 | in. 40 | in. 44 | in. 48 | in. 52 | in. 56 | in. 60 |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Wider than | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 60 |
| and including | | | | | | | | | | |
| To No. 20, inclusive..... | 36 | 39 | 42 | 46 | 50 | 55 | 60 | 65 | 70 | 75 |
| Nos. 21, 22, 23 and 24..... | 37 | 40 | 43 | 47 | 51 | 56 | 61 | 66 | 71 | 76 |
| Nos. 25 and 26..... | 38 | 41 | 44 | 48 | 52 | 57 | 62 | 67 | 72 | 77 |
| Nos. 27 and 28..... | 39 | 42 | 45 | 49 | 53 | 58 | 63 | 68 | 73 | 78 |

Discount from List 15 % to 25 %.

Brass and Copper Wire—

List January 17, 1894.

| Numbered by Stubs' gauge. | Soft & hard high brass. | Spring high brass. | Low brass. | Copper. |
|------------------------------------|-------------------------|--------------------|------------|---------|
| All Nos. to No. 16, inclusive..... | \$0.22 | \$0.24 | \$0.26 | \$0.30 |
| No. 17 and No. 18..... | .23 | .25 | .27 | .31 |
| No. 19 and No. 20..... | .24 | .26 | .28 | .32 |
| No. 21, or 0.032 diameter..... | .25 | .27 | .29 | .33 |

Discount 15 % to 25 %.

Fine Numbers.

| Numbered by London gauge. | Brass. | Spring high brass. | Low brass. | Copper. |
|---------------------------|--------|--------------------|------------|---------|
| No. 22..... | \$0.26 | \$0.28 | \$0.30 | \$0.34 |
| No. 23..... | .28 | .30 | .32 | .36 |
| No. 24..... | .30 | .32 | .34 | .38 |
| No. 25..... | .32 | .34 | .36 | .40 |
| No. 26..... | .35 | .37 | .39 | .43 |
| No. 27..... | .38 | .40 | .42 | .46 |
| No. 28..... | .42 | .44 | .46 | .51 |
| No. 29..... | .45 | .47 | .49 | .54 |
| No. 30..... | .48 | .50 | .52 | .57 |
| No. 31..... | .51 | .53 | .55 | .60 |
| No. 32..... | .55 | .57 | .59 | .64 |
| No. 33..... | .59 | .61 | .63 | .68 |
| No. 34..... | .64 | .66 | .68 | .73 |
| No. 35..... | .70 | .72 | .74 | .79 |
| No. 36..... | .76 | .78 | .80 | .85 |
| No. 37..... | 1.00 | 1.02 | 1.04 | 1.10 |
| No. 38..... | 1.30 | 1.32 | 1.34 | 1.40 |
| No. 39..... | 2.00 | 2.02 | 2.04 | 2.10 |
| No. 40..... | 2.60 | 2.62 | 2.64 | 2.70 |

— 1/2 discount.

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